

Optimizing Photoshop for Peak Performance

Adam Jerugim

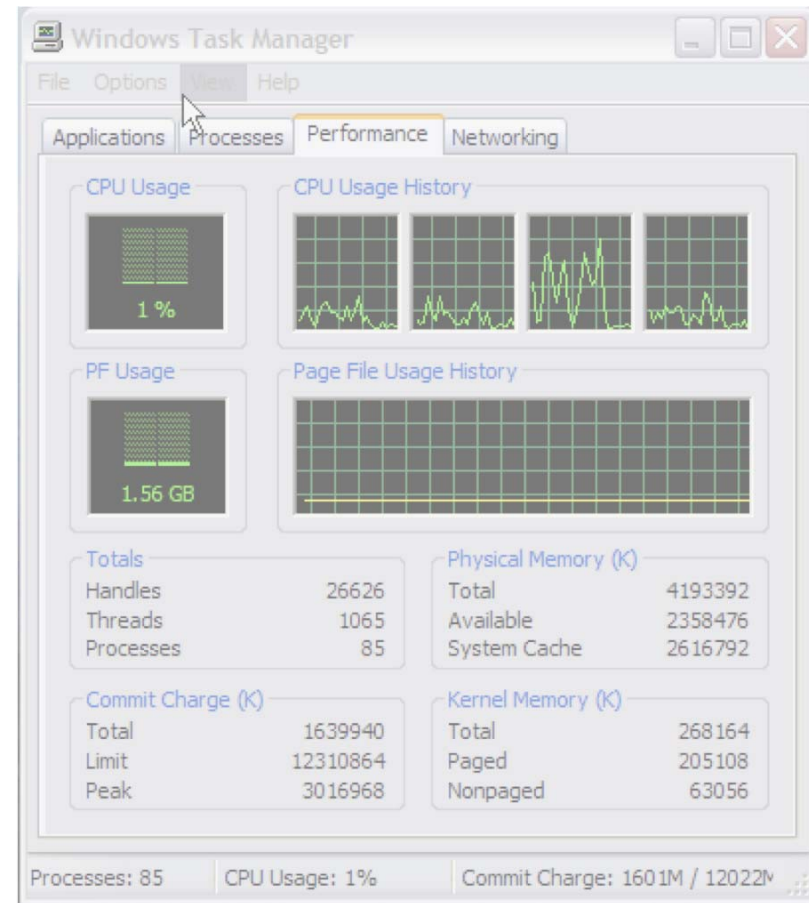
Photoshop QE Product Lead

July 18th, 2009



What we will cover

- Watching your system
 - Why you want to watch
 - What to watch
 - How to watch it



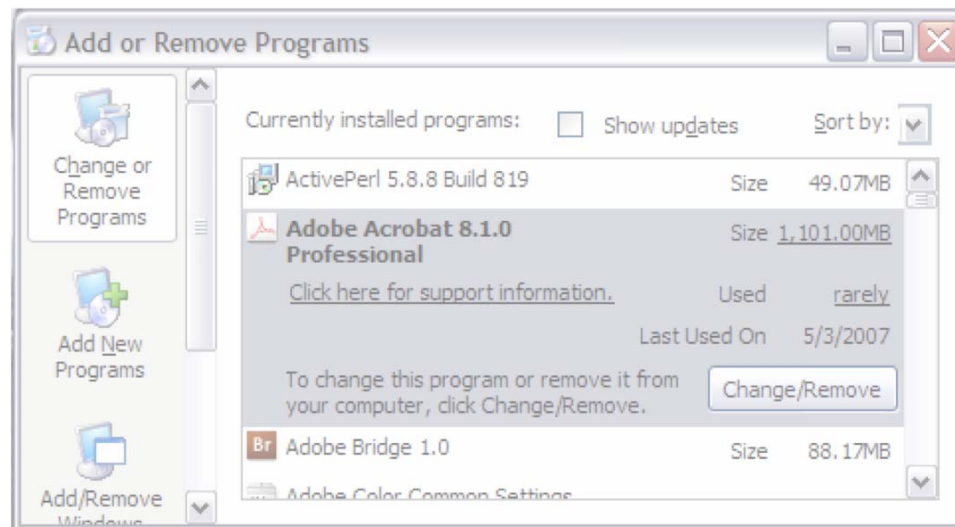
What we will cover

- Watching your system
- Testing and Numbers
 - How to test your own system
 - Some of our results



What we will cover

- Watching your system
- Testing and Numbers
- Keeping things clean
 - Good habits
 - Things to avoid

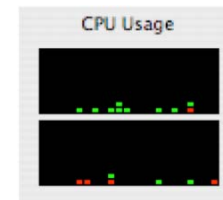
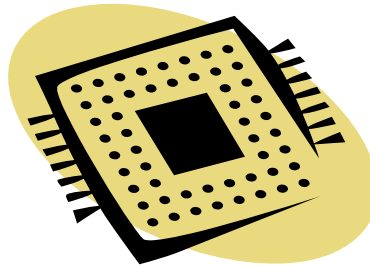
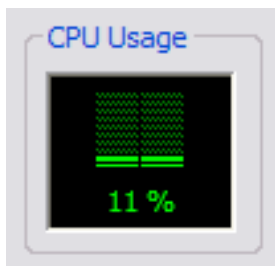


What we will cover

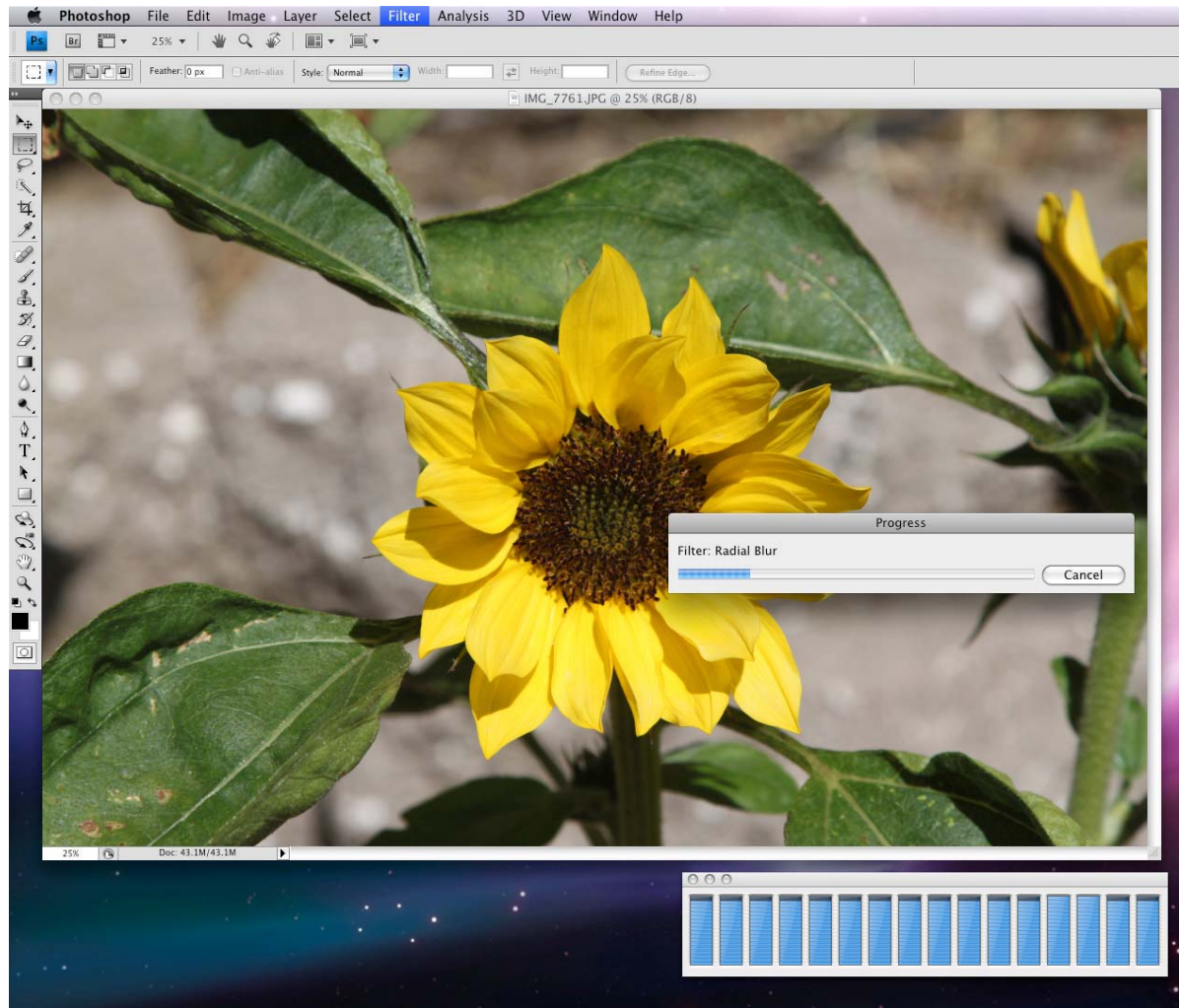
- Watching your system
- Testing and Numbers
- Keeping things clean
- Setup guidelines
 - Photoshop setup
 - Purchase priorities
 - Operating systems

Watching - Basics

- CPU
 - Ultimate speed limit.
 - Improvements outpacing the rest of the system.
 - Often starved waiting for memory...
but you can't tell or do much about it.
 - Photoshop can use multiple cores, but diminishing returns beyond 4.



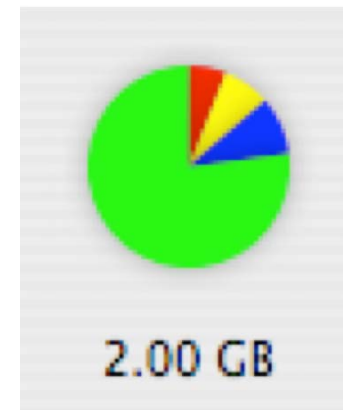
Watching - Basics



Watching - Basics

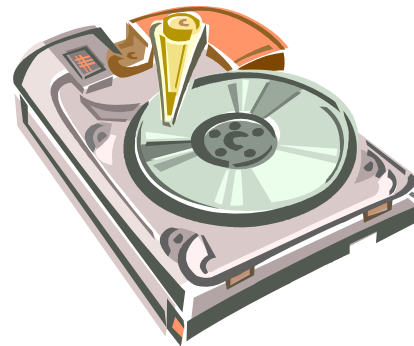
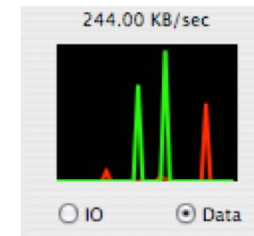
- CPU
- Memory
 - Not as fast as it used to be.
 - Many operations memory limited.
 - You can't tell when CPU is waiting.
 - Look for faster memory systems: Intel "front side bus speed", multiple AMD CPU chips
 - Often not big enough.
 - Watch the efficiency number.
 - If you run out...

Physical Memory (K)	
Total	4193392
Available	2384952
System Cache	2191696



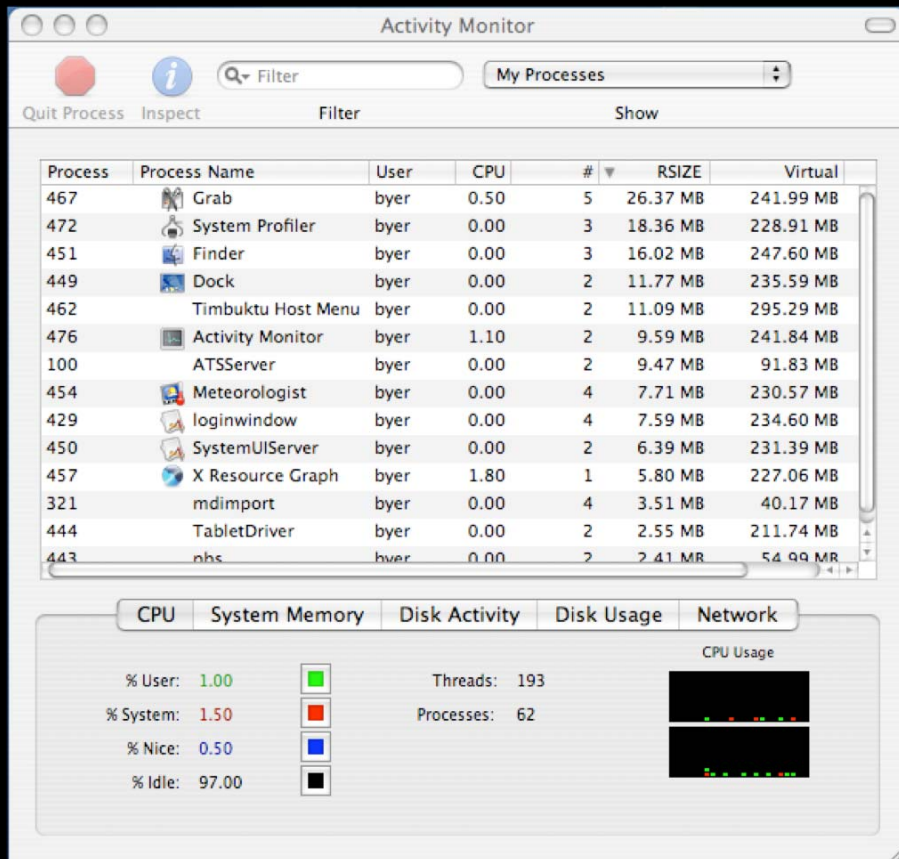
Watching - Basics

- CPU
- Memory
- Disk
 - Glacial speeds.
 - Physical limitations.
 - Competing access is bad
 - Faster rotation, faster transfer good
 - RAID helps a lot
 - Capacity no longer an issue.

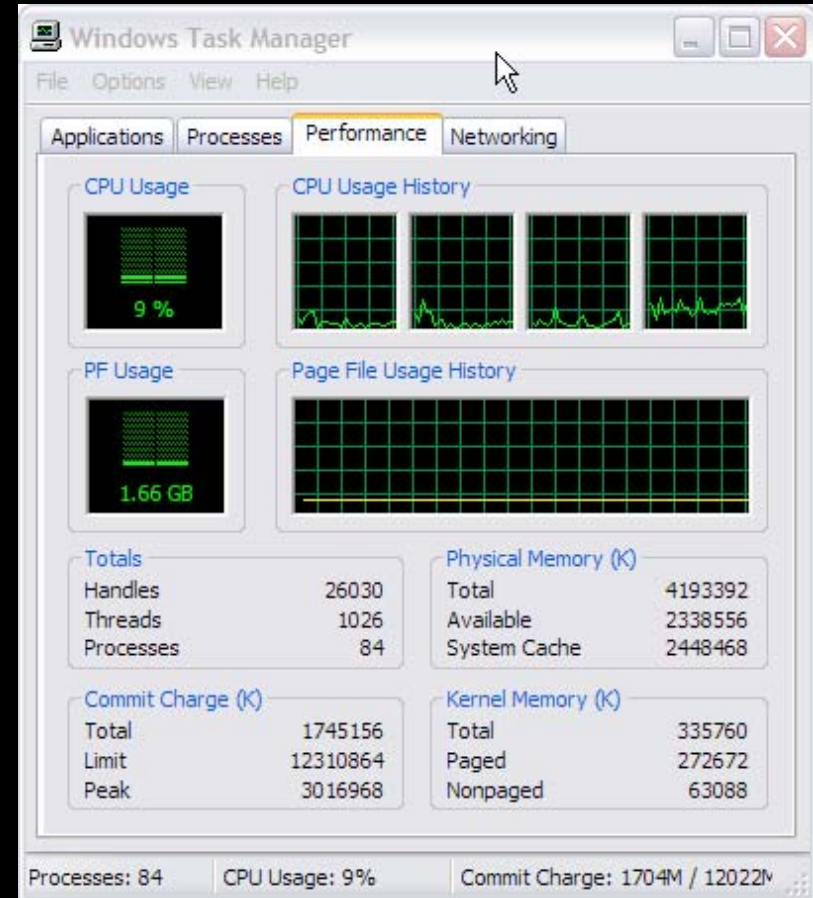


Basic Monitoring Tools

Macintosh – Activity Monitor

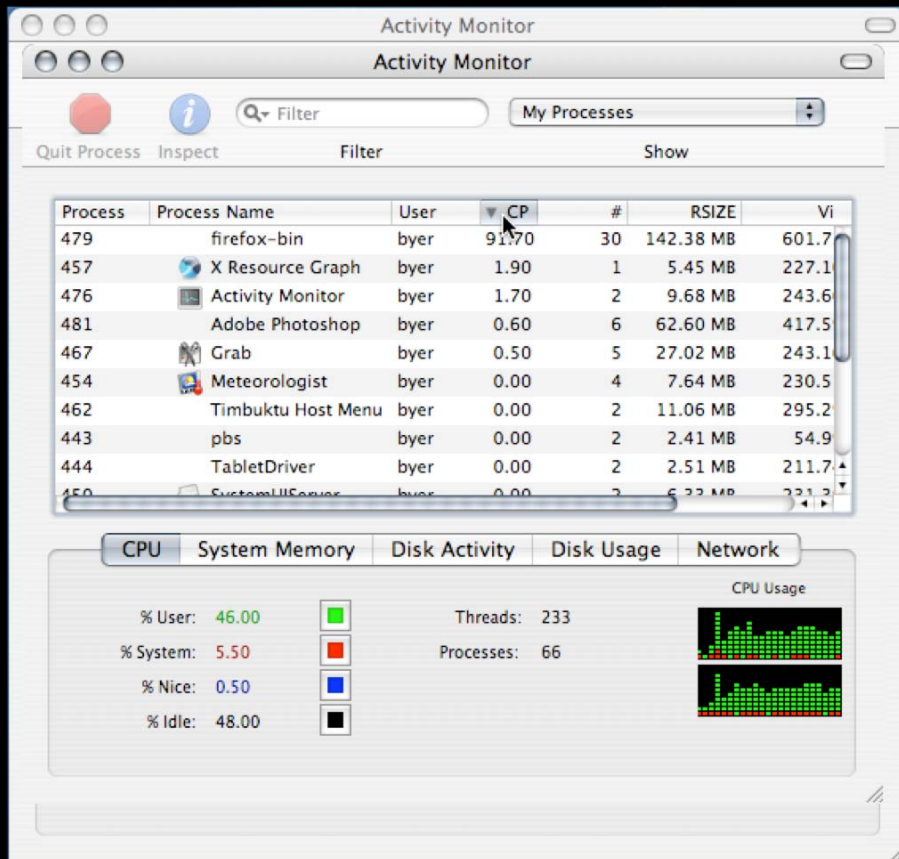


Windows – Task Manager

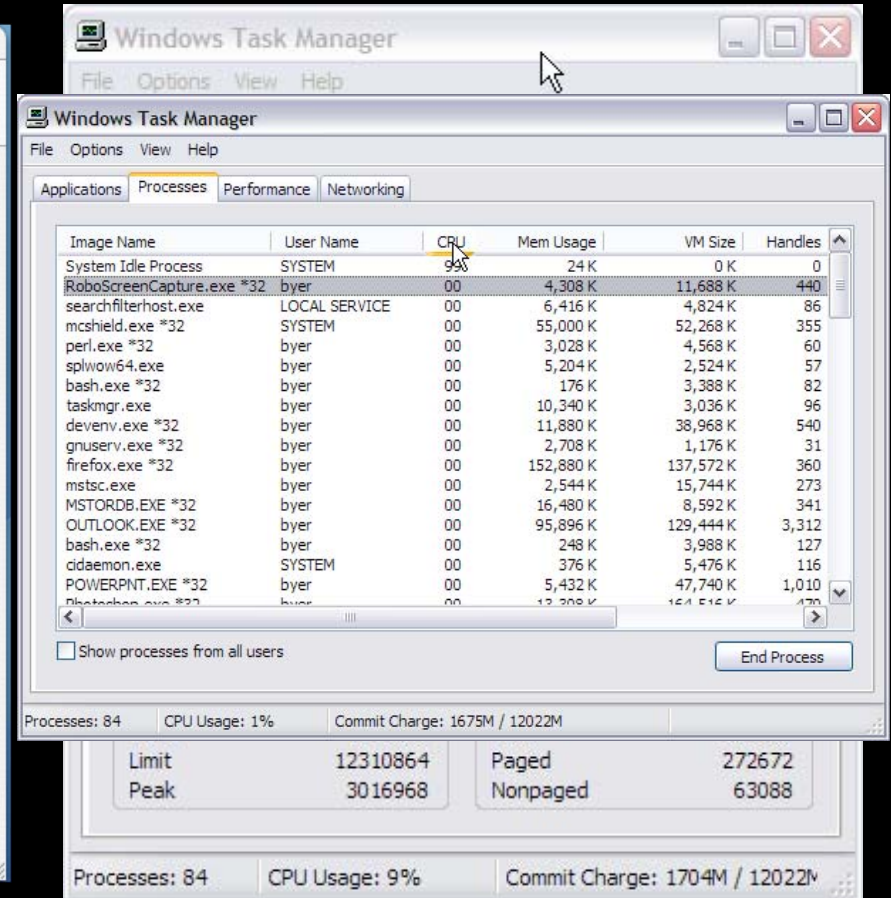


Basic Monitoring Tools - CPU

Macintosh – Activity Monitor

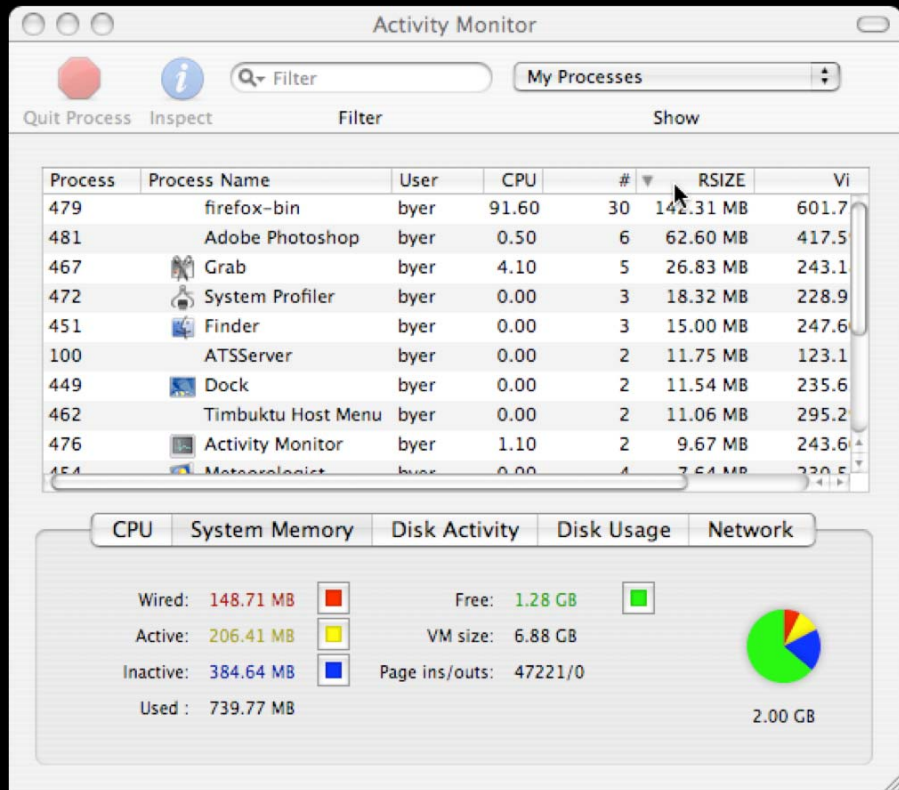


Windows – Task Manager

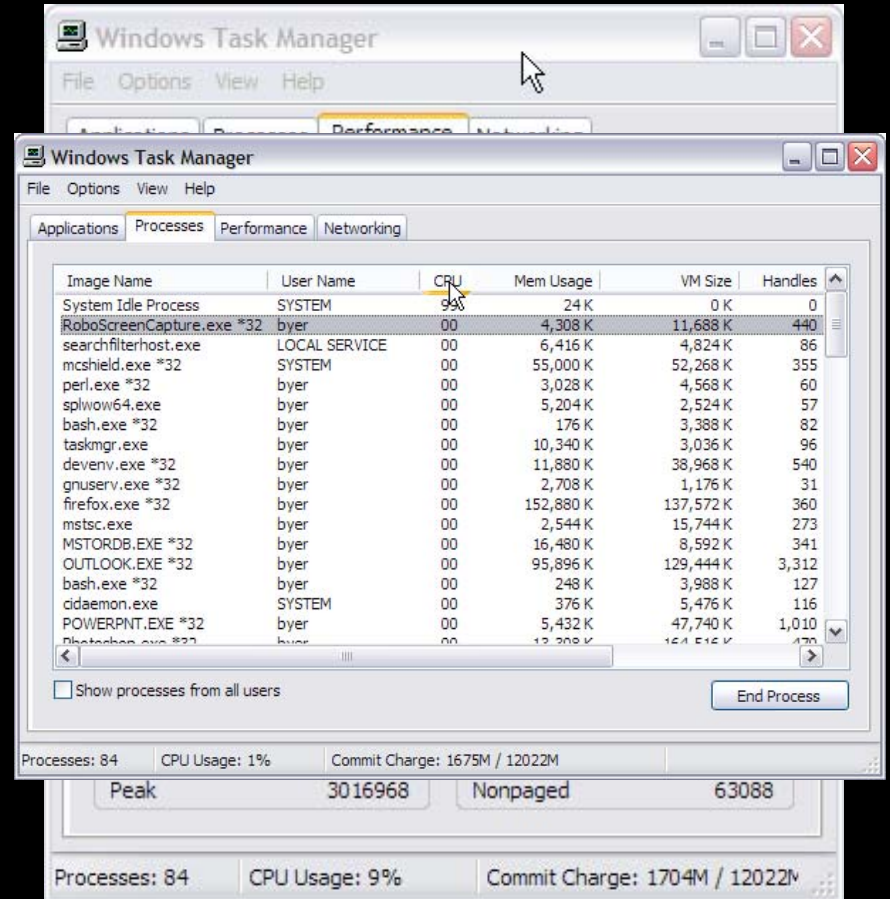


Basic Monitoring Tools - Memory

Macintosh – Activity Monitor

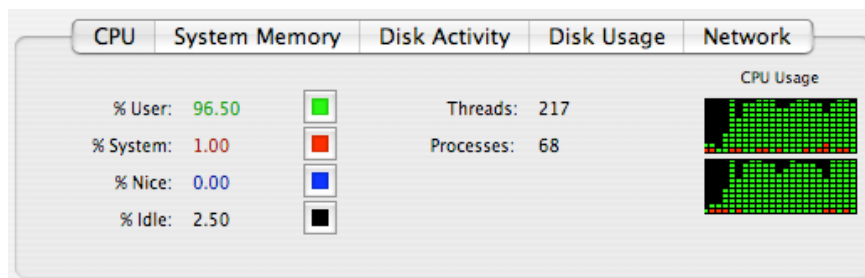
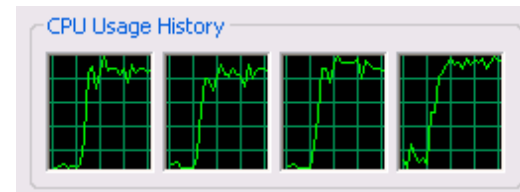
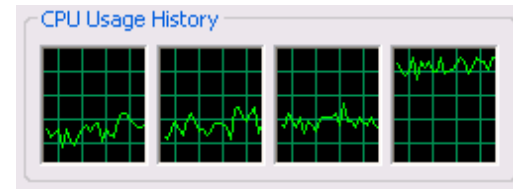


Windows – Task Manager



What To Look For

- CPU
 - Is it idle when you think it should be busy?
 - Is it swamped when it shouldn't be?

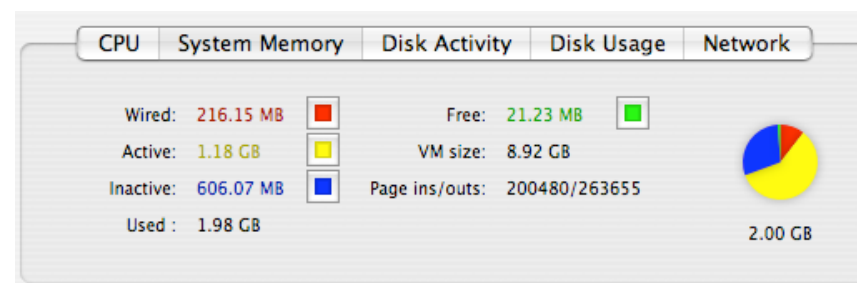


What To Look For

- CPU
- Memory
 - Don't want too much in use
 - XP: Available about 50000
 - Vista: Cached about 50
 - Mac: Inactive + Free about 50MB

Physical Memory (K)	
Total	4193392
Available	44808
System Cache	258352

Physical Memory (MB)	
Total	2046
Cached	238
Free	2



Finding the right settings...

- Find a reliable and repeatable way to test Photoshop on your system
- There are three types of tests you can use to check system performance:
 - tests that fits in RAM
 - tests that don't fit in RAM
 - To force this type of test, use the largest documents you typically use and many history states.
 - tests that mirrors your typical workflow

Retouch Artists Speed Test

<http://www.retouchartists.com/pages/speedtest.html>

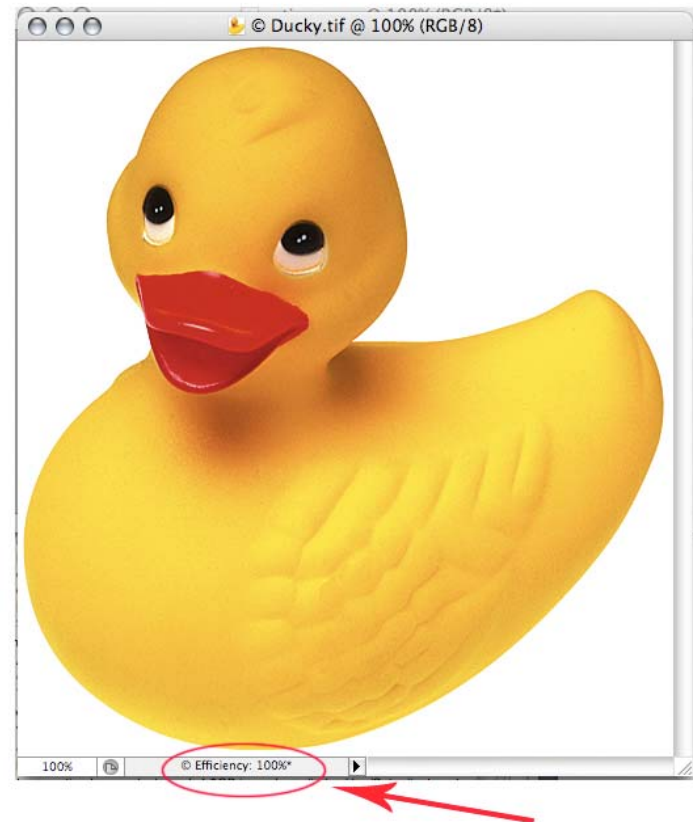
- The package contains a test action and test image and is a great way to start your performance tests. Other users have posted their results to the Retouch Artists website and that data can be used to compare performance on similar hardware.



Retouch Artists Speed Test

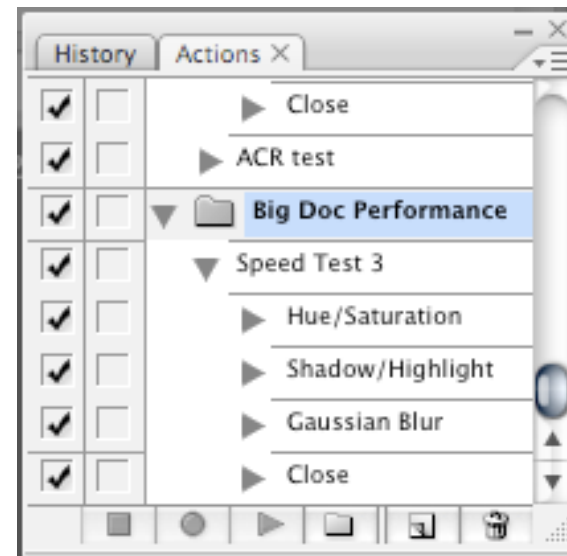
When does a test 'fit in RAM'?

- Check to see if the test image you're using is smaller than the total physical RAM of your system.
- Efficiency (found as an option in the PS document window) should be >95%



How to create a test based on your workflow

- What are the most common functions you use in Photoshop?
- Create an action based on those functions and use a stopwatch to time how long it takes to complete those functions.
- In my action I opened a large (~4.5GB image), applied a Hue/Sat adjustment layer, applied a Shadow Highlight, Gaussian Blur, and then closed the image.

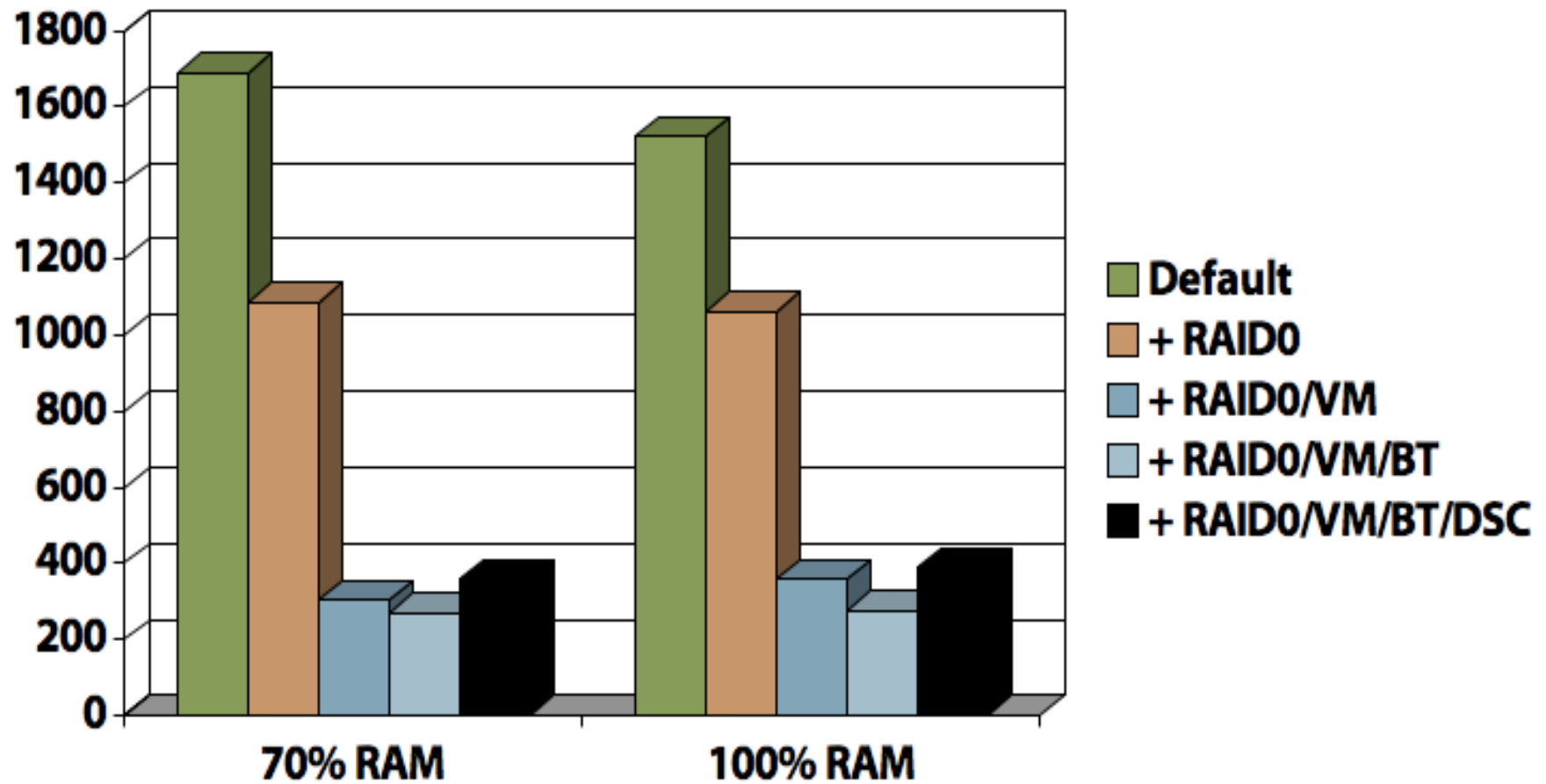


Ways to run your tests...

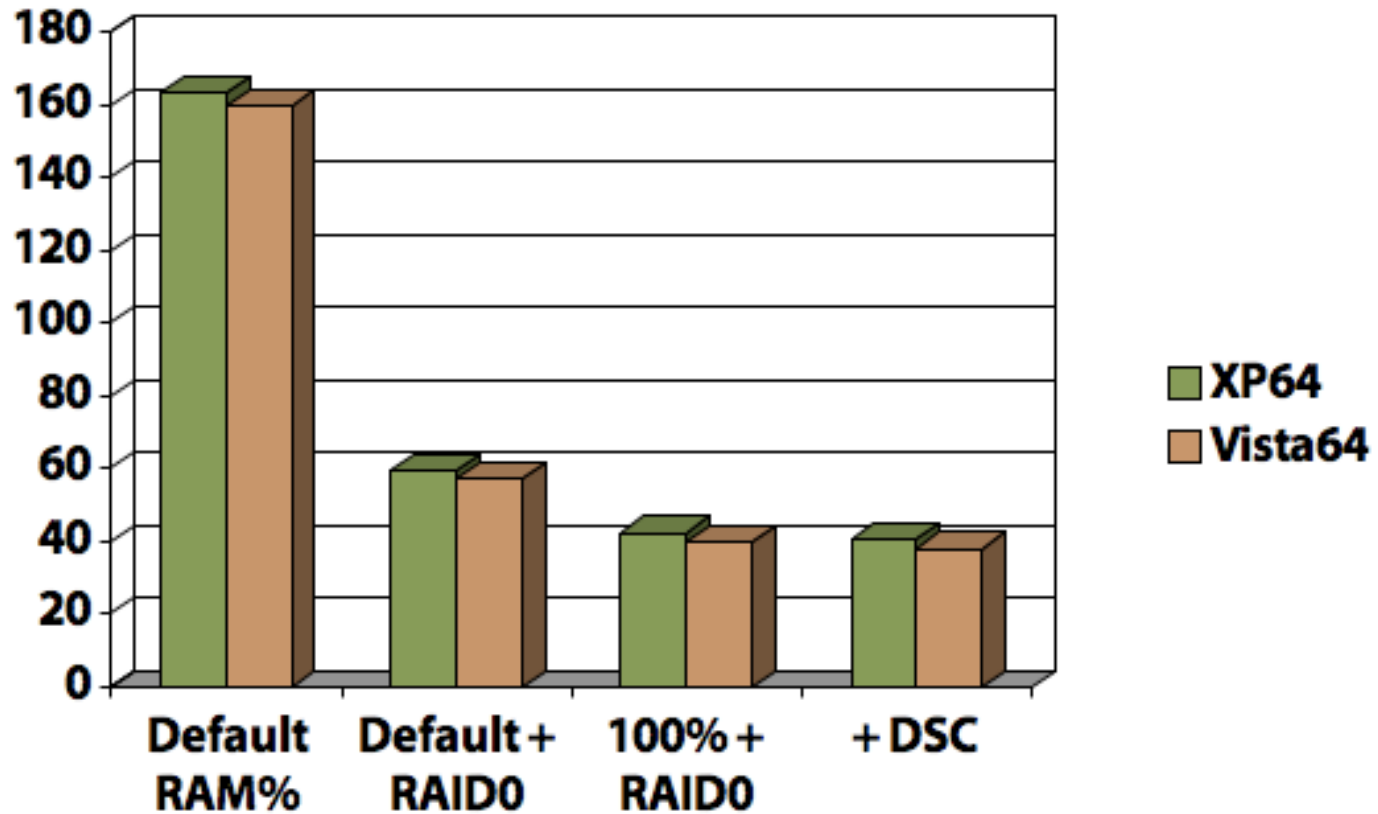
- Use a stopwatch or create a script that runs and times an entire action
- Start with default settings for your baseline and then make changes to see which ones improve the time to complete your test (note that the same performance tweak that speeds up test A may hurt test B).
- Start by adding more RAM, change scratch discs (try RAID if possible), enable VM OS buffering (if disabled by default), Bigger Tiles, and adjust cache levels based on image type.



OS X Big Doc Action (20 History States)

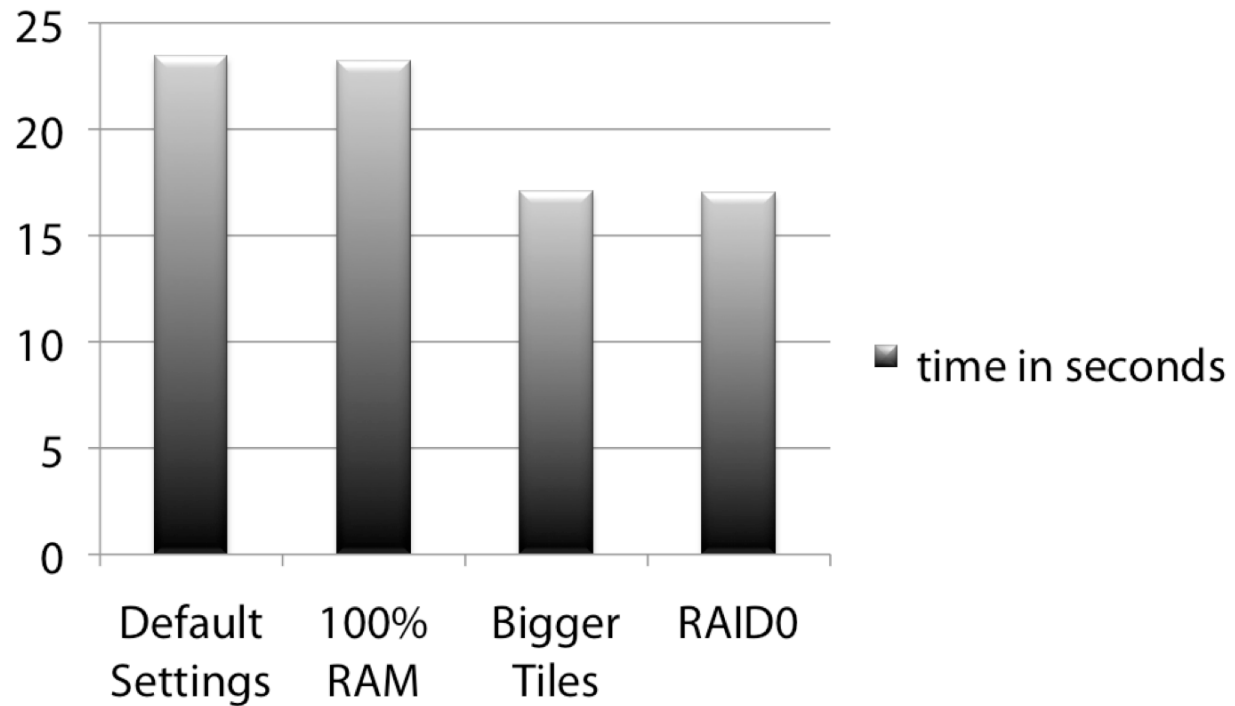


Windows Speed Test Results (20 History States)



CS4 OS X Speed Test Results

Retouch Artist's Speed Test



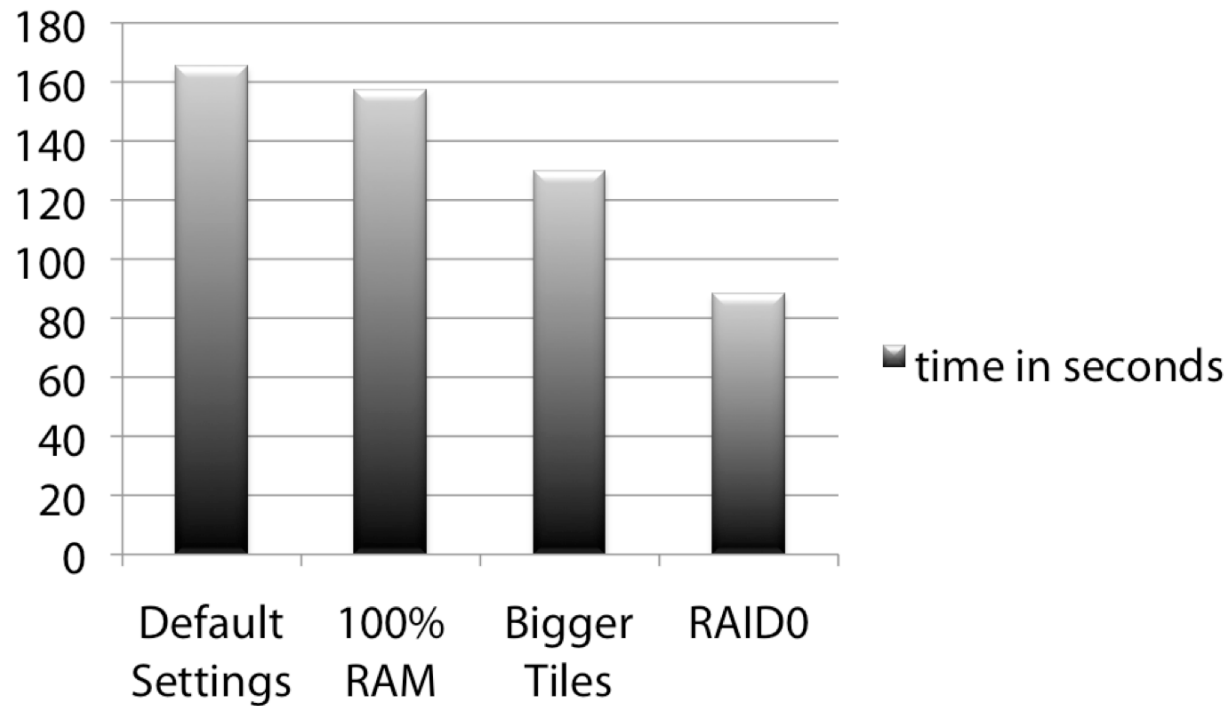
CS4 OS X Performance Results

- The latest tests results are from a MacPro 2 x quad-core Nehalem (2.66GHz) system running OS 10.5.7 with 12GB RAM and a nVidia GT 120 video card.
- The following tests can be found as part of the Mac Performance Guide by Lloyd Chambers:

<http://macperformanceguide.com/OptimizingPhotoshop-Benchmarks.html>

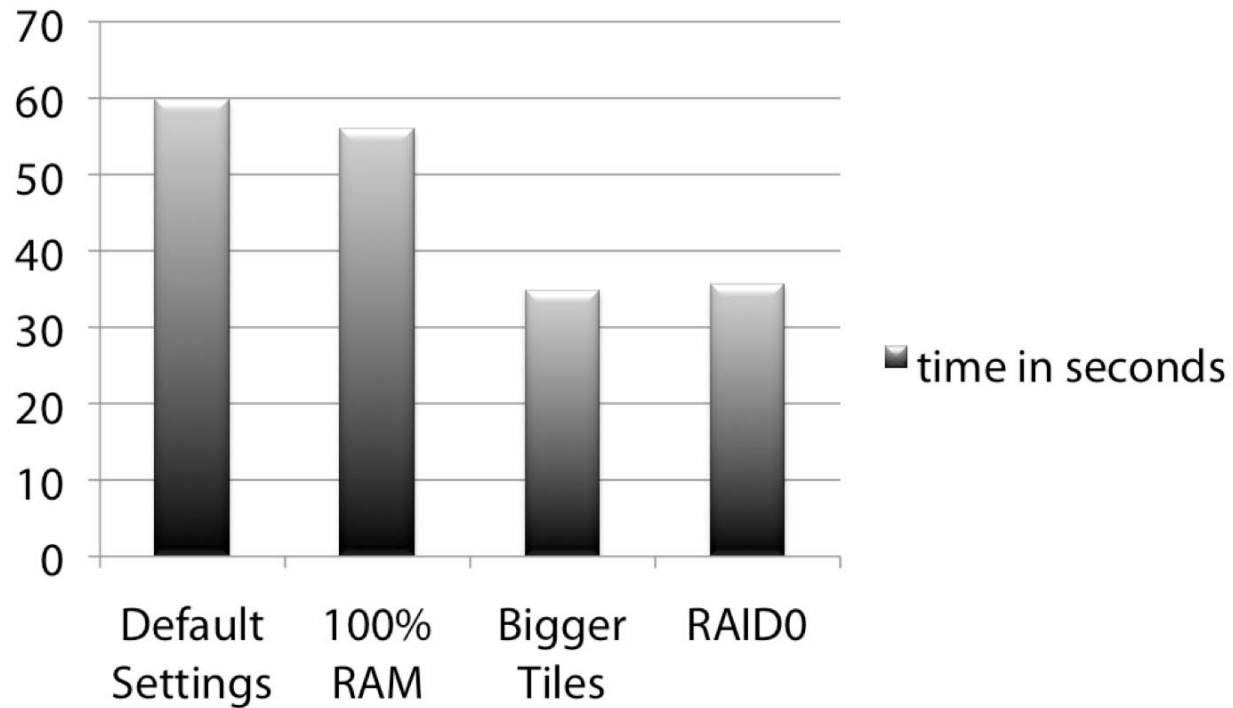
CS4 OS X Performance Test Results

diglloydMedium Performance Test



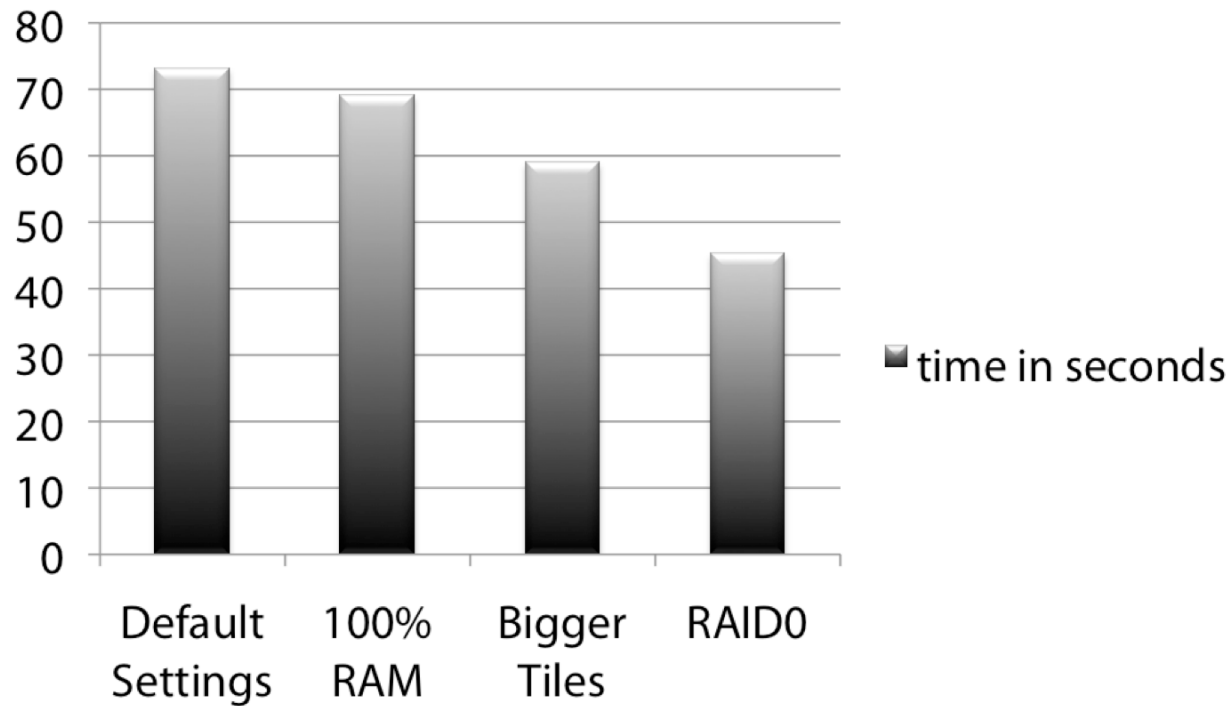
CS4 OS X Performance Test Results

diglloydSpeed1 Performance Test



CS4 OS X Performance Test Results

PshopTest Performance Test



this test can be downloaded from:

<http://www.macgurus.com/forums/showthread.php?t=20218>

Photoshop Acceleration Basics

Photoshop Acceleration Basics is a hardware performance guide by George Middleton. It can be found here:

<http://homepage.mac.com/boots911/.Public/PhotoshopAccelerationBasics2.4W.pdf>

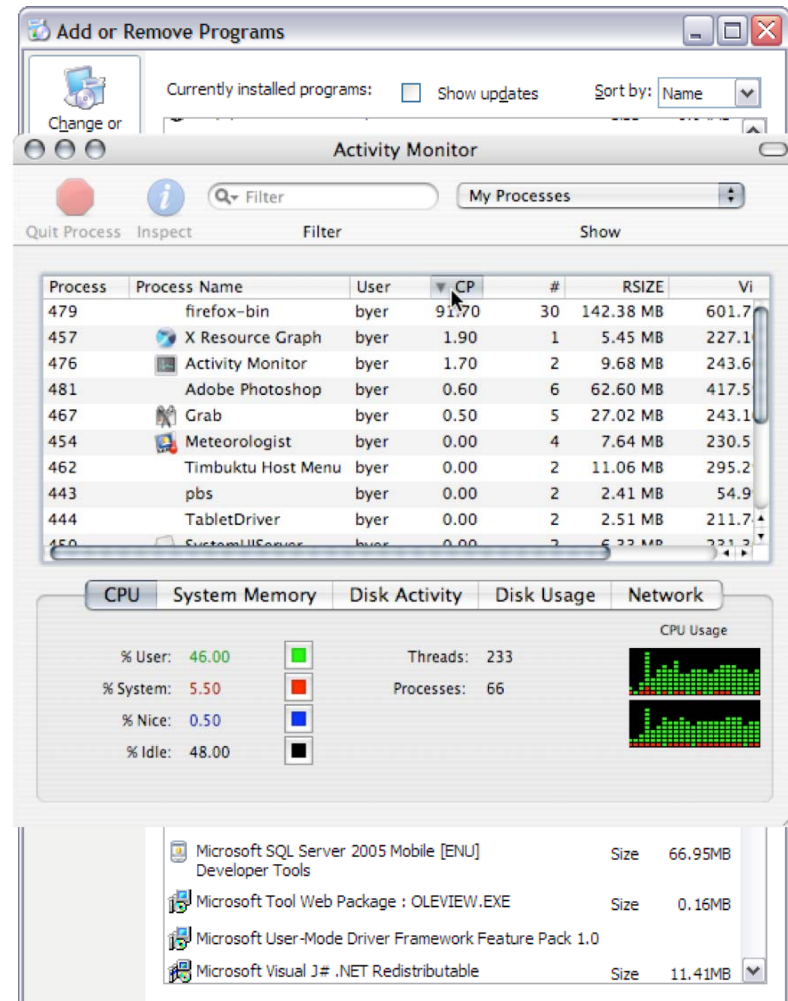
Photoshop Acceleration Basics 2.4
A MacGurus Guide to Photoshop Performance Acceleration
© 2007 George Middleton All rights reserved

Table of Contents

2	An Overview	9	Virtual Memory Buffering
2	Multiple-processor Macs	10	The Bigger Tiles Plug-in
3	Mac OSX	11	The Memory Slider
4	Photoshop Versions	11	Installed RAM Guidelines
6	Photoshop and Memory	12	Photoshop and Hard Drives
6	The Scratch Disk	12	Disk Guidelines
7	The Swapfile	14	More on Scratch Disks
7	Page-swapping	15	Optimized Configurations
8	Disk-thrashing	17	Maintenance Tips
8	The Reality of RAM	17	A Holistic Approach

Keeping things humming.

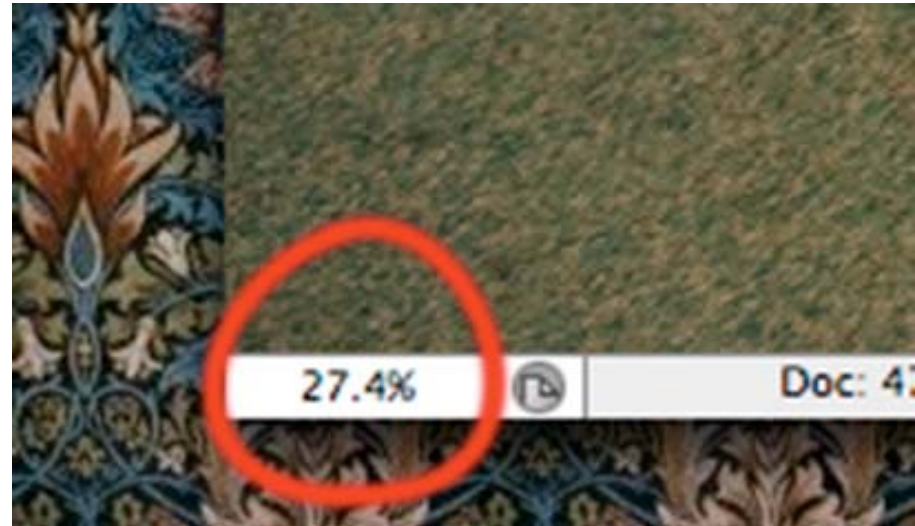
- Cleanliness is next to fastness.
- You installed *what??*
- Beware the cloaked pig.
- Find a better virus scanner.



Photoshop Setup: Cache Levels

- If you use lots of layers:

Zoom level that fits on screen	Cache levels
50-100%	1
26-50%	2
13-25%	3
6-12%	4
3-5%	5
<3%	6



< Whoa! This is the default?

Photoshop Setup: Bigger Tiles for Bigger Files

- If you use lots of layers and small files, don't use Bigger Tiles
- If you use big pixel dimension files with only a few layers, try Bigger Tiles
- If you use huge files with lots of layers... experiment.
- Bigger Tiles and high cache levels = lots of scratch space.
 - Unload unneeded textures and brushes to reduce scratch space waste
- Bigger Tiles and high cache levels and lots of layers = tons of scratch space and wasted RAM.

Photoshop Setup: Video Card

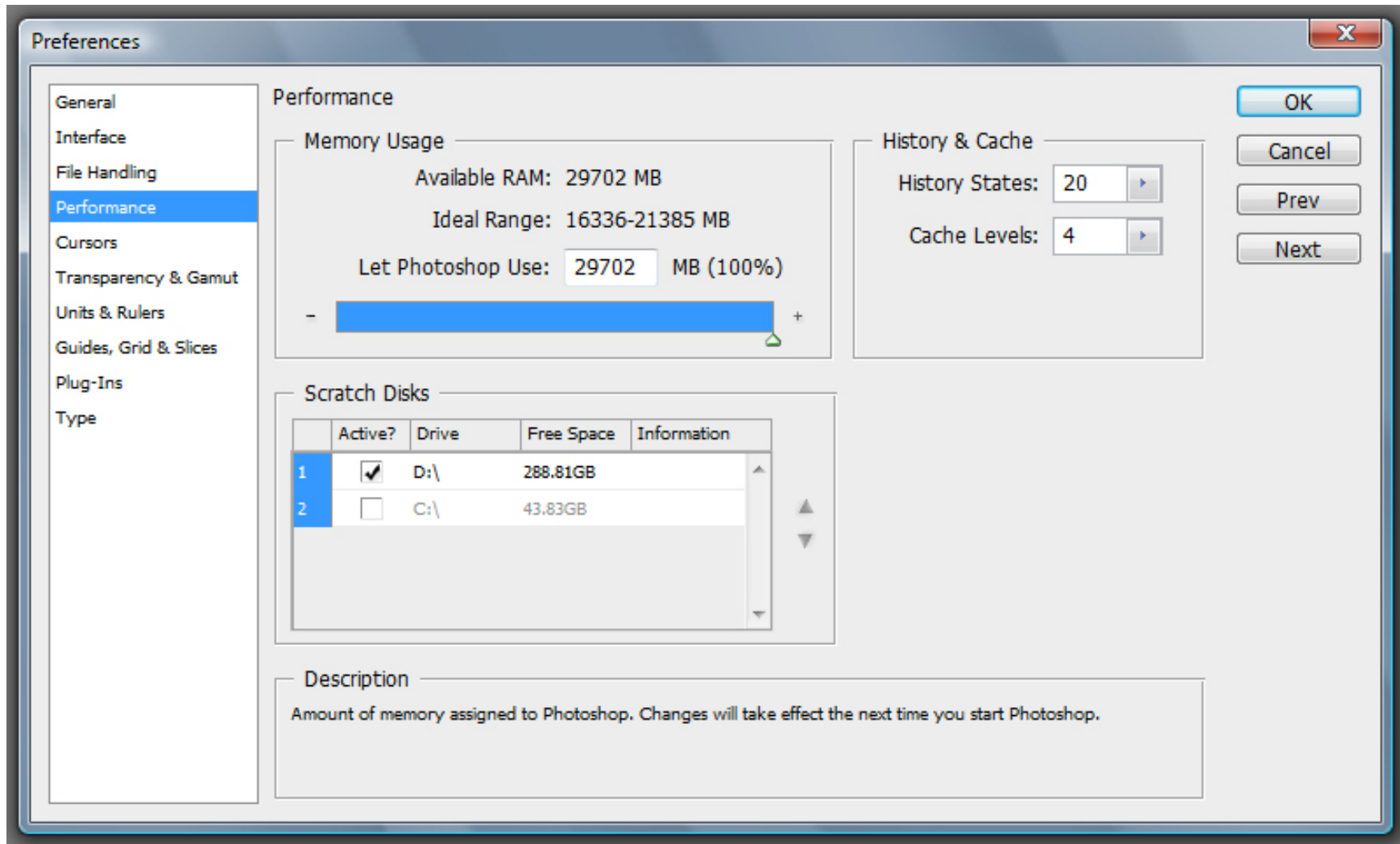
- OpenGL/GPU features in Adobe Photoshop CS4: Smooth Display at ALL Zoom Levels, Animated Zoom Tool, Animated Transitions when doing a One Stop Zoom, Hand Toss Image, Birdseye View, Rotate Canvas, Smooth Display of Non Square Pixel Images, Pixel Grid, Move Color Matching to the GPU, Draw Brush Tip Editing Feedback via GPU
- 3D GPU features include: 3D Acceleration, 3D Axis3D Lights Widget, Accelerated 3D Interaction via Direct To Screen
- If you're thinking about getting a new video card you should consider the following:
 - Get a card that supports Shader Level 3.0/OpenGL 2.0/DX10
 - Get a card that has at least 256MB VRAM (512MB is better)
 - Get a card that takes advantage of PCI-E x16 bus speeds



Photoshop Setup: 64-bit

- Starting with Photoshop CS4, Photoshop will run natively as a 64-bit application on 64-bit versions of Windows
- To take advantage of this, you must have a 64-bit Windows OS (Windows XP 64-bit or Windows Vista 64-bit)
- Most modern CPUs support 64-bit, but if you're unsure check Intel or AMD's website
- Make sure you have a motherboard that supports at least 8GB RAM (the more RAM the better as RAM access can be 200x faster than disc access)
- Photoshop will use as much RAM as you can put in your system...

Photoshop Setup: 64-bit (cont.)



Where to go next?

Macintosh

- **Number of Processors/Cores:**
Four or more
- **Operating System:**
OS 10.5.7
- **Disk:**
At least two drives
- **Memory:**
Get to 6GB (especially on Leopard)
- **Disk:**
RAID 0
- **Memory:**
More!

Windows

- **Number of Processors/Cores:**
Four or more
- **Operating System:**
Windows Vista 64-bit (any but Home Basic)
- **Disk:**
At least two drives
- **Memory:**
Get to 6GB (Vista x64) or 4GB (non-x64)
- **Disk:**
RAID 0
- **Memory:**
More! (x64 only)

These slides can be found @

http://blogs.adobe.com/jnack/2008/04/notes_on_tuning.html



Adobe