

AMD/ATI – ConnectPress Webinar Q & A, July 21, 2009

Please see the main article at

http://www.solidworkscommunity.com/feature_full.php?cpfeatureid=44763

Which includes the webinar broadcast, powerpoint presentation, zip files with macros and Q & A

Answers in <AB> below

And a number of questions if the ATI Memory Viewer will work only with ATI cards or will it work with nVidia cards or other graphic cards.

<AB> The tool will only work with ATI cards

Also, list the tool address for me as some people asked for that.

<AB> <http://www.amd.com/us/products/workstation/graphics/Pages/workstation-graphics.aspx>

Then select the “Tools” link on the left

Where’s the best place to point users if they want more info on ATI cards and comparisons?

People asked about the most powerful and if we would list make/models. Q: Do you had good guidelines for card versus model size.

<AB> The AMD website has product info and comparisons. Go to this link:

<http://www.amd.com/us/products/workstation/graphics/ati-firepro-3d/Pages/ati-firepro-3d.aspx>

and on the right, you will see a link called “Compare FirePro™ graphics cards”

Do you have similar guides versus CPU?

<AB> Go to:

<http://products.amd.com/en-us/>

Select the type of processor (ie., Desktop, server, etc.) and you will be able to compare the various CPUs

Will there be a power point presentation available to convince management on equipment improvement? Allen – is there some doc that would be good for mgmt?

<AB> not sure I understand this question?

Here are the remainder – you can determine which should be answered? Some may be able to be grouped – seemed like a few asked about 64-bit, etc.

1. Q: My CPI is maxed during the process, but unable to tell whether GPU is handling the load as well. Thanks for the tips on memory mapping, am using Nvidia though.
<AB> Can't speak to Nvidia GPUs and how they map memory
2. Q: /3gig switch critical to use in 32 bit XP pro for best performance?
<AB> The /3GB switch is not specifically for performance. Use it if your applications can't fit into 2GB of space normally allocated. Not recommended you use it for performance. Microsoft documentation talks about this in detail
3. Q: Have crashed my workstation dozens of times over the last week trying to do some larger renderings in Photoworks. With Photoworks does the videocard handle much of the load when rendering to a file rather than to the screen?
<AB> Photoworks is mainly CPU based, so the graphics card doesn't do much here except display the final results

4. Q: Is OpenGL being replaced by DirectX?
<AB> In general, no. SolidWorks is OpenGL based, they have not announced any plans to move to DirectX. In the past few years, some applications have moved from OpenGL to DirectX, but some have moved from DirectX to OpenGL.
5. Q: Does ReadyBoost help?
<AB> we have not done much testing with it, it's possible if you have to fetch data files from a server that is not providing good performance for you
6. Q: Will there be Stream / CUDA support for SolidWorks?
<AB> have to ask SolidWorks this question
7. Q: Benchmarks are run at low resolution (1280x1024 = 1.3 megapixels). How does increased resolution affect performance? Newer workstations run at 1920x1200 = 3.1 megapixels.
<AB> this will depend on the benchmark. In general, modern graphics cards can render up to 2560x1600 (30" monitor, full resolution) about as fast as 1280x1024. SPEC is moving its new benchmarks to 1920x1200 resolutions. That said, if your application needs to rewrite to the same pixels a number of times to produce the final image, you would write a lot more pixels on a 3.1Mpixel display than a 1.3Mpixel display. So in the end, the application has a lot to do with it.
8. Q: Do SLI / Crossfire combos help?
<AB> It will depend on your particular workflow. SLI & Crossfire work by splitting up the graphics workload across 2 or more GPUs. If the overhead of managing the multiple GPUs is more than the graphics rendering speedup, you won't see much improvement.
9. Q: Are workstation graphics cards necessary these days? Would a cheaper high end gaming card be sufficient?
<AB> as we showed in the presentation, workstation graphics cards offer significant performance advantages over consumer cards for professional applications. Also, SolidWorks and other workstation application vendors do not certify their applications on consumer cards, so if you ran into a problem, it may be difficult to get their customer support to help you.
10. Q: Is it true that the memory on the graphics card counts against the 4GB limit under 32-bit OS?
<AB> to some extent, though it is not 1-1, 2GB graphics card does not consume 2GB of system memory for example. Every device on your system, including the graphics card, will consume some amount of memory.
11. Q: Can you make available the SolidWorks macro to rotate a model 500 times and track frame rate?
<AB> will have to check with the tool developers to see if it is possible. To count frame rate, you can use FRAPS, a publically available tools, Google search will get it for you.
12. Q: 2. Is it true that the memory on the graphics card counts against the 4GB limit under 32-bit OS. If so, does it subtract from the OS memory (1GB with switch) or the application memory (3GB with switch)?

<AB> See question 10 above

13. Q: Can you make available the SolidWorks macro for "500 rotations and frame rate count"?

<AB> see question 11 above

14. Q: I design assemblies that have about 800 parts. mostly hardware. The assembly file is about 22 meg. I have 4 gigs memory running a quad core 64 bit processor with win xp 32 bit. I am constantly getting memory errors and Solidworks shuts down. How can I avoid this? Will 64 bit OS help speed and reliability? I am constantly getting "Can not obtain required memory" and SolidWorks shuts down. File size SLDASY + 22 meg. 800+ parts. Mostly hardware. quad core 2.4 gig Intel proc. Dell t3400. 4 gig memory. Nvidia 3800 graphics.

<AB> if you are running out of memory, 64 bit OS will help as you can install more physical memory or swap space in excess of 4GB. 64 bit won't automatically give you more performance, just more space to run your applications.

15. Q: Has anyone determined why some SW installations get a "Black" SW background?

<AB> not familiar with this, have you asked SW customer support?

16. Q: Will models with lots of surfaces (1000's) put more demand on a system than a model with a large tree (features)?

<AB> hard to say for sure. The features tree probably tops out eventually, so would assume that you could create more surfaces, but couldn't say for sure. Good question for someone at SolidWorks

17. Q: what may cause a vga freeze in Solidworks. although it seems that everything is free (cpu,memory) the only thing is that a very large assembly is open. I have borrowed high end vga card from the vendor and got the same results. Eyal asks: what may cause a vga freeze after a large assembly was loaded. 64 bit machine with 4gb and high end vga card

<AB> would need more details to say for sure. The graphics driver could be processing the assembly, assuming you have waited for some time to see if anything eventually got rendered, if not, may be an issue with the graphics card driver. Did you try a card from another vendor?

18. 32 bits? 4 gb? waht are we working on? paint? You cannot run solidwork on a consumer card, this is irrelevant. ahci for drive speed? is it better? vista 64, 8 gig ram, once at this point, what can improve preformance more? vista is faster 4 times than xp on drawing loading, (25 min become 6 min) why dont you talk about it? unless you have a direct x 10 application ?

<AB> lot of questions here. As you can see from question 9 above, many people do inquire about running SolidWorks on consumer cards. Market data also indicates that most workstation users are still using 32bit XP. We do talk about Vista, but current market data indicates that the majority of workstation users still use XP, so with only 45minutes to do the webinar, we have to cut some data. Vista does have some performance advantages, but overall, graphics performance of XP is slightly ahead of

Vista. The webinar focus was on improving graphics performance. Much can be done to improve loading, overall disk performance, just not enough time to include these topics.

19. Q: does dual monitor configs really hurt performance? if only running solidworks on one of them
<AB> in general, this should not have much of an impact on performance. It does take GPU memory for the other display, so if you are running on the edge of your graphics card memory, the second display will consume a little more.
20. Q: Any tips for improving open times for network connected models?
<AB> sorry, probably a good question for SolidWorks people
21. Q: is AMD going to develop mobile workstation cards in the future?
<AB> AMD, and other graphics vendors, currently don't develop mobile cards for consumers, ie., a graphics card you can install into your laptop. We do have AMD workstation graphics in HP and Lenovo laptops, with more on the way from other vendors coming.
22. Q: I just wanted to mention a couple of things I have done to improve gains was to make a 3G switch and to add a separate swap file harddrive.
<AB> Yes, you do need to have at least 3GB of swap to enable the 3GB switch, if you don't, the flag is ignored.
23. Q: Have you done any testing on Solidworks 2010
<AB> Not a lot yet, beta is just starting for it
24. Q: Does running a Xeon processor improve performance and stability over other processors. currently I am using a 3.33 dual Xeon with 8GB ram. I work with large files in surfaces and find the curvature deviation in some of the files to large to be workable is this software limited or file complexity. I work on a dual Xeon w/ Quadro FX4800
<AB> We have a mix of processors in our labs, can't say that we have seen more or less stability from Xeon processors. They seem to be as reliable as other processors. Some of the desktop Intel processor 'Extreme' editions do have really high clocks and large caches, we have seen some of these exceed Xeon performance, depending on the application, but they are usually fairly expensive.
25. Q: does the curvature deviation in the document options drive by the card or the software? size or complexity of file?
<AB> believe this is done by software, not aware of any contribution by the card.
26. Q: as many solid modeling programs do not take good advantage of hyperthreading do to the linear nature of them what is a viable solution to core numbers.
<AB> that depends on what else is running on your workstation while using your modeling program. The other cores can enable other processes to be run and help minimize the time your modeler gets swapped out. It would take some investigation on your part to determine the best number of cores, but in general, good to buy the best CPU you can afford.

27. Q: what is fastest AMD cpu for SolidWorks?
<AB> Currently there is only 1 workstation that is available with AMD CPUs, the HP xw9400. You can get them with dual 3.1Ghz CPUs
28. Q: Is it good to use interleaved Raid drives to improve performance?
<AB> we haven't done a lot of testing to determine optimal disk performance, so can't say for sure. In general, if your disk access is slow, disk interleaving can help.
29. Q: How can you tell if you are writing to swap?
<AB> if you use the Windows Task Manager, it shows how much physical memory is available and also the amount of paged kernel memory, stuff that it has possibly written to swap
30. Q: how does someone increase the amount of cache per core?
<AB> there are several caches for CPU cores, they are fixed by design. There are tools provided by CPU vendors to disable or otherwise manipulate them. Check with your CPU vendor.
31. Q: but won't you have to make sure that all hardware you have will be able to work with the 64 bit system?
<AB> Yes, all peripheral drivers and other hardware/software will have to work with the 64bit system. Users seem to have a bit more success here with Vista 64.
32. Q: Could he give us a general overview on the effect of 32 vs 64 bit machines?
Specifically on the ability for 64 bit machines to access more RAM?
<AB> Just about all machines now are 64 bit, so assuming you are referring to 32 vs 64 bit OS. Most of the users who move to 64 bit OS do so in order to get access to more memory. 32 bit OS are limited to 4GB of total memory (Windows XP actually limits a single process to 3.25GB). A 64 bit OS can theoretically 16 exabytes of memory, but XP 64 is limited to 128GB of physical memory and 8 terabytes of virtual memory. I believe Vista has the same limits (though I should probably double check)
33. Q: will partitioning the hard drive and setting VRAM help with performance
<AB> if you are seeing IO as a performance issue, might help, but might be better to look for other issues first.
34. Q: Does MS Vista now support OpenGL and not just ActiveX?
<AB> Vista provides a software version of OpenGL. If you install a 3rd party graphics card (or if your system comes with one) then the vendor's OpenGL implementation will be used.
35. Q: Can RAID significantly improve performance? Vista? 32 bit vs 64 bit and on what OS? XP, Vista, Win 7?
<AB> we have not done a lot of RAID testing. If you are seeing significant disk read/write performance, it could help, OS shouldn't make too much difference if you need RAID. Your system disk controller will be a big factor in determining how many disks you will need to achieve optimal performance.

36. Q: Our IT suggested opening over our gigabit ethernet from the very fast harddrives on the server. Have you tried opening over gigabit ethernet?
<AB> we don't have access to a lot of really large files, so even though we uses gigabit Ethernet, not sure we can provide a lot of input here.
37. Q: Vista Performance "Base Score" reflect change in Solidworks performance?
<AB> sorry, don't understand the question
38. Q: What about add-on programs like BlankWorks? How should they be setup to run?
<AB> Don't have much experience with BlankWorks. The vendor should be able to offer optimal settings.
39. Q: Do you need AMD graphics card to use these graphic card performance tools or will they work with other vendor cards also?
<AB> The memory viewer will only work on AMD graphics cards.
40. Q: On the software tune up side, what about regcleaners? Have you used these programs to smooth out the processing? How about defrag progrms oher than the one windows uses.
<AB> For optimal benchmark testing, we will often use fresh systems with clean installs on the disk to remove issues related to disk fragmentation, registry and other issues that happen over time. It's probably a good idea to try to clean up your system from time to time, registry cleaners and disk defragmenting are good practices and could help boost performance.
41. Q: Any comments on type/amount of RAM
<AB> You should follow the recommendations for your OEM/motherboard vendor. For a 32 bit OS, 4GB will be the limit. In general, get the fastest speed memory you can get, go with 4GB if you can for 32 bit OS, for 64 bit OS, you can use the Windows Task Manager to see if you have exceeded the amount of physical memory currently in your system. If you can minimize swapping to disk, you will see better performance
42. Q: 32bit windows xp versus 64bit. are there performance gains?
<AB> the main advantage with 64bit is that you can use more memory, so if your performance issues are due to paging or running out of memory, 64bit can help. Unless your application makes heavy use of 64bit entities, like lots of double precision math, performance between 32 and 64 bit XP will be about the same.
43. Q: 3GB flag?: Swap is ~1000 times slower! x64 vs x32 especially as it relates to low level multi-threading on quad cores? Cosmos analysis performance issues/demands?
<AB> Not sure I understand the questions. See questions above relating to 3GB flag, x64 vs x32. Not familiar with Cosmo Analysis, so can't speak to it directly. The techniques we discussed during the webinar should apply to any graphically oriented application.
44. Q: what is more important - L2 or L3 cache ?
<AB> Not sure there is an easy answer here. CPUs will look for data first in L1, then in L2, then in L3. Each cache is a bit slower than the previous, ie., L2 is faster than L3, but

L3 is probably a lot larger. Some multi core CPUs even share their L3 cache among cores. Including an L3 cache is a further optimization for CPUs, many CPUs now include L3 on the CPU die. So I guess having both an L2 and L3 would be better as it gives the CPU another cache for data before it has to go out to RAM which is much slower.

45. Q: When SW is hanging but CPU and Memory are not maxed out. How do we determine the reason for performance lag?
<AB> Assuming by 'hanging' you mean spends a long time doing a specific operation. You can use the Windows Task Manager to see what the CPU is doing, enabling it to show kernel times could help indicate if the OS is busy. If there is a specific operation in SW that causes the performance lag, you can contact SolidWorks for help as well.
46. Q: I assume the ATI video card mem viewer will only function with ATI cards and not nVidia, is this correct?
<AB> Yes, the memory viewer only works on ATI cards
47. Q: OS XP vs Vista vs Win 7? Any benchmarks on 64bit of these?
<AB> still a little early for Win7, we are testing, but no public results. In general, there is not much difference between 32 and 64 bit unless you are running out of memory on 32 bit, at least from a graphics perspective.
48. Q: Have you evaluated the 3GB switch for memory ?
<AB> not sure what is meant by 'evaluated'? The 3GB flag is not meant for performance, it simply limits the memory available to the OS kernel to 1GB and expands user space to 3GB, normal split for Windows 32 bit is 2GB kernel, 2GB user.
49. Q: I have a Dell M65 Mobile Workstation. There is an NVIDIA Quadro FX 350M Graphics card installed. Can this card be replaced? What does AMD have to offer that will improve my performance?
<AB> unfortunately there are no mobile cards that users can purchase to replace the original mobile graphics. Laptops are designed with very specific power and thermal requirements, so difficult to replace them with other parts that were not considered as part of the original design. There are laptops from all the major OEMs that use AMD FireGL and FirePro professional graphics.
50. Q: Two small cards in Crossfire/SLI or one large card?
<AB> This is highly dependent on the application and data set. For most applications, one large card will provide better performance, but applications that are fill rate limited or render the same pixels multiple times, Crossfire/SLI can offer significant advantages.
51. Q: I'm using the V7700 and having problems installing the Catalyst software that come with the driver 8.583. Using Xp64 Pro with 6GB of RAM. Any tips?
<AB> Would need more details, but in general, try removing all previous graphics drivers completely from the system. Then reboot and try to install the drivers. Are you getting specific error messages? You can contact AMD customer support, they should be able to help.

52. Q: What about utilizing core affinity in Task Manager to set Solidworks to a singular core to keep other programs from robbing CPU cycles?
<AB> If your workloads indicate that you are using a lot of CPU for SolidWorks, this could help. Fairly easy to test, so give it a try!
53. Q: What about utilizing core affinity in Task Manager to set Solidworks to a single core to keep other programs from robbing CPU cycles?
<AB> same as #52 above
54. Q: Will not having a PCI-E 2.0 bring that noticeable difference?
<AB> It depends. As the PCI bus is the transport mechanism for graphics data, if you are experiencing poor graphics performance, it could be that you are saturating the bus with data. In this case, PCI-E 2.0 will provide twice the performance with respect to bus bandwidth.
55. Q: What causes graphics to blackout partially in Solidworks i.e menu areas turn black?
<AB> sounds like some kind of bug, you should contact SolidWorks customer support.
56. Q: How does HDD speed and type (SSD, SATA, SAS etc) effect solidworks performance?
<AB> If you are experiencing extremely long times when opening your data files, faster HDDs might help. My group focuses on graphics, so we have not done a lot of testing with respect to disk configurations. That said, if we are building the fastest machines possible for testing, we have used SSD drives to maximize performance.
57. Q: I have a V5250 on my laptop/T60P, dual monitor mode. would you comment on dual monitors, one runs in analog, one in HDMI
<AB> Many users are moving to dual monitor configurations, so they are part of the normal ATI testing process. Monitors and the various data formats vary in quality and performance, so difficult to make general statements. There are also several modes to use multiple monitors that can affect performance. The stretch modes, where both monitors look like one big giant display, usually provide a little better performance than extended desktop, but some users don't like having the 1 larger virtual monitor.
58. Q: will a 64bit os improve perf on systems with less than 4gb main memory running SW 2008
<AB> In general, 32 bit and 64 bit performance of SW is about the same, so would not expect any gains moving to 64bit with less than 4GB, if you run out of physical memory, it will need to swap to disk on both 32 and 64 bit.
59. Q: is sw 2009 low level multi threaded
<AB> No, not really. The GUI uses some threads so that you can cancel out of long-running tasks, but the low level code is not highly threaded with 2009.
60. Q: can you comment on using the uservn switch in boot.ini to reserve memory.
<AB> Assuming you mean the 'userva' flag. The userva flag changes the way the 3GB flag works, you use them both together. The 3GB flag will give user programs 3GB of the 4GB total memory available to 32bit Windows operating systems, limiting the OS kernel

to 1GB. This might not be enough space for kernel, with all of your add-on drivers for all of your devices, to run very well. If you use the 3GB flag, you can use the `userva` flag to fine tune the amount of address space allocated to user programs. For example, setting `/3GB /USERVA=2700` will set user space to 2700MB, allocating 300MB more for the kernel. Remember, you have to have at least 3GB of swap allocated for the 3GB flag to take effect. Microsoft documentation has lots of details on this.

61. Q: What about FLASH HDD'? One more question, FLASH or Solid State hard disk drives?

<AB> Depending on what specs or tests you look at, solid state drives are about 100 times faster than traditional rotating platter disks. From that perspective, seems like it would provide better performance. Cost is a big factor, 250GB SSDs cost about \$700, if money is no object, you can get good performance. If disk IO is not your bottleneck, might be better to spend money on a faster CPU or graphics card.