



Workstation Innovation News

Understanding your desktop technology

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Issue focus: Mobile Workstations for CAD

During 2007, our [newsletters](#) focused on the fixed infrastructure of desktop workstations, blade workstations, and the configuration maintenance of it all. In this edition, we're going to switch gears and concentrate on getting your work done on the road using the increasingly capable HP mobile workstations that perform like their desktop brethren.

When you go to your boss with a request for one of these mobile heavy hitters, you're likely to get a comment like, "Why can't you go to Best Buy and get a Compaq for \$800, like I saw in the paper this weekend?" In order to counter these arguments, you'll need to understand more about mobile workstations' power and capabilities. And believe me when I say you're not going to do on-site 3D CAD design, rework digital renderings, or project full-motion video on HD monitors using that \$800 Best Buy special!

Armed with the facts, you'll have a much better chance of getting the high-end hardware you need to be a digital road warrior.

Not a Consumer Laptop

Many of us have come to view working on the road as having to accept a less-functional laptop computer. And while today's consumer laptops can sport dual-core processors and 2 GB of memory, they don't offer the disk and graphics speed or maximum RAM that we're used to seeing at our desktops.

To contrast what makes a mobile workstation different from a consumer laptop, I'll touch on the following topics and explain each as we go:

- Hard disks
- Graphics card architecture
- Graphics card output
- Software optimization

Hard Disks



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[HP Performance Tuning Framework](#)

Use PTF resource collector to watch your memory usage in the background, and see how many times you run out of main memory. Avoid disk access to improve your productivity.

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In CAD environments, you're only as good as your hard disk because there is so much disk access when manipulating huge models. Most consumer laptops trade off disk speed to achieve 200 MB or more of disk space. A quick look at the specifications of many laptops reveals 4200 rpm disk speeds rather than the more robust 5400 and 7200 rpm speeds available on mobile workstations. And while you might not think that drive RPM makes a big difference, 5400/7200 rpm speeds yield 28% and 71% better hard drive performance, respectively, when compared to 4200 rpm speeds. If you've ever waited for a conventional laptop to perform a large rendering or model change, you've seen the difference a fast hard drive can make.

Mobile workstation hard drives also utilize shock-protection drive mounts to protect drives from damage due to inadvertent dropping or striking of the machine. This lowers the possibility of data loss significantly. If you've ever dropped your briefcase out of an aircraft overhead bin (guilty as charged), you'll appreciate the added data protection.

Graphics Cards

Of course, one of the main reasons you're running high-end CAD software is that you want to actually see what you're designing, right? And in a computer context, seeing means having a graphics card and monitor subsystem that can deliver the resolution, color depth, and speed you need to do your job. Many consumer-based laptops implement lower-resolution graphics devices with a low amount of video memory (256 MB) or utilize shared memory with the main CPU. In these architectures, you're sacrificing resolution, depriving your main CAD application of memory and slowing the performance of your graphics system as video computations are streamed over the CPU's memory path, rather than remaining isolated on the graphics card.

And when high-resolution presentations are required, the typical consumer laptop's 1280x800 resolution limitations can be insufficient for display on HD tuners or large-format digital monitors, which can run up to 1920x1200. To achieve these resolutions, graphics systems with dedicated RAM amounts up to 512 MB with CAD-specific drivers are required. You'll find these types of graphics systems on mobile workstations but never on a consumer-based laptop.

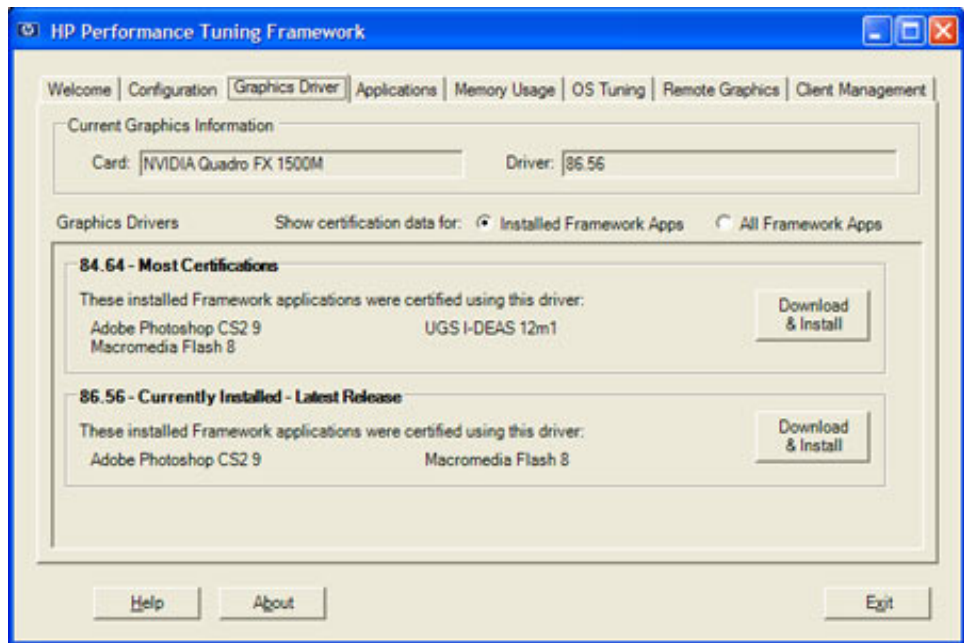
Graphics Output

Increasingly, computers need to output video to a variety of digital devices, not just a spare monitor or video projector. Consumer laptops come equipped with the traditional VGA (25 pin female connector) output, and that's usually it. To get any more output options, you'd have to invest in a portable digital interface.

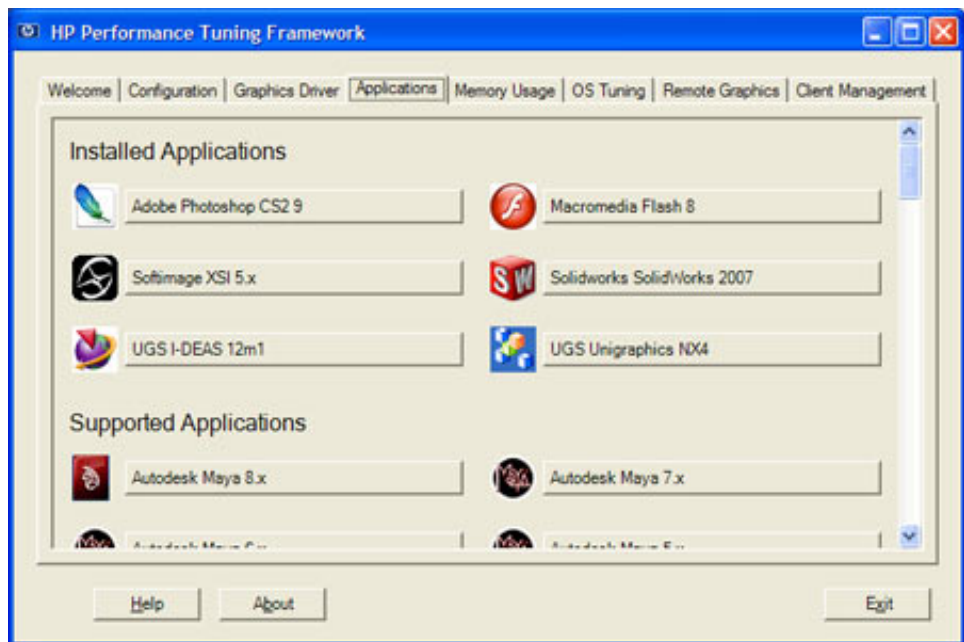
Mobile workstations come equipped with HDMI outputs for direct connections to external HD monitors - fantastic for demonstrations or design reviews in conference rooms. In fact, when you are in the office you may want to use a large-format HD monitor on your own desktop!

Driver and Application Management

Consumer-style laptops rarely provide optimized drivers for 3D CAD applications, and even if they do, what guarantee is there that they'll be kept up to date over time? Just consider the changes from Open/GL graphics drivers used in Windows XP to Direct 3D in Windows Vista, and you can see that keeping graphics drivers up to date has real bearing on how well your investment will be protected.



HP mobile workstations excel in driver and application management via their Performance Tuning Framework applications, which keep your graphics drivers up to date as well as allow you to allocate RAM and processors to your CAD applications to achieve maximum performance. And the best part is that all you have to do is let the application download and install the latest certified drivers for your machine without having to search through a bunch of manufacturer's Web sites.



Mitigating Up-Front Cost

Of course, purchasing the kind of mobile workstation power we're referring to is going to cost more than the \$800 special at Best Buy. So how do we make the case that the extra money will be well spent? Let's perform a quick computation based on 15 minutes per day of saved time based on a senior engineer with 25% overhead and see how quickly a faster laptop can pay for itself.

Labor cost: A \$75,000-per-year senior design engineer works 48 weeks per year with 25% overhead. Assuming 40 hours per week, the hourly cost for this employee works out to \$48.82 per hour (1.25 x \$75,000 divided by 1920 hours per year).

Saved time: If we save this engineer 15 minutes per day, that will add up to 1.25 hours per week (5 days per week), which adds up to 60 hours per year (48 work weeks per year).

Saved money: At \$48.82 per hour over 60 hours per year, we're saving \$2,930 in engineering time - enough to pay for a nice mobile workstation in year one and pocket the savings in year two. And if this much-faster computer allows our employee to examine more design scenarios, make better client presentations, create HD-quality conceptualizations for marketing, or otherwise "sell" conceptual design better, you're probably saving a lot more!

Mobility's Value

What do we gain by having high-end design firepower that can be thrown in a carryon bag and flown to the customer's oil derrick, building site, or conference room? What about the ability to make heavy-duty design changes overnight in the hotel room to meet client expectations the next morning?

Perhaps the better question to ask in today's market is this: How mobile do your team members need to be? How important is it to have a technically enabled design staff that can go to the client's facility and not be hampered by reduced computing performance? What sales opportunities could your organization realize if you had a mobile design team that was just as empowered as those who currently sit in your office?

These are interesting questions that only you can answer. But if you view mobility as having value, you're going to need a mobile workforce with real computing power, not an \$800 Best Buy special.

Wrapping Up

During the past decade, we've seen laptop computers go from being clunky, underpowered machines to lighter and higher-powered systems that are perfectly adequate for general-purpose computing but are lacking the firepower needed for serious CAD. Mobile workstations have now made desktop-level performance possible in your airline carryon bag.

And while mobile workstations do cost more than a consumer laptop, the timesavings gained from the speed, configuration control, and graphics performance can quickly justify the expense. If supporting mobile CAD users is part of your computing strategy, a quick analysis of your options may be in order.

Links

Data Sheets (*pdf files*):

- [HP Compaq 8510w Mobile Workstation](#)
- [HP Compaq 8710w Mobile Workstation](#)

Website: www.hp.com/go/mobileworkstations

Bio

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