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The Ultimate Machine for Extreme Prepress

When I hear the words *ultimate machine*, my mind conjures images of huge earthmovers reshaping the landscape, or perhaps a home improvement television host extolling the virtues of some rotary-bit impact hammer, followed by a chorus of caveman-like grunts. Likewise, whenever I hear an extreme prefix, it suggests an air of danger, excess or eccentricity to an otherwise mundane activity. Yes, the adjectives *Ultimate* and *Extreme* have taken on glamorous new personalities in today's reality-centric media world and have been applied to everything from makeovers to toaster ovens.

Remember when prepress was the driving force behind computer hardware development? Early desktop publishing applications and extreme prepress activities such as RIPping a file challenged the boundaries of processor technology and the stressed the limited memory of early systems. When Adobe brought image editing to the desktop, it seemed that computer manufacturers constantly struggled to bring the ultimate bigger-better-faster machine to market just to meet the growing demand for MIPS (Millions of Instructions Per Second).

Sitting in the grey-bar hotel

To put things in perspective, the *Mac Plus* (1986) that many consider to be the original Desktop Publishing computer utilized a *Motorola 68000* processor that achieved 1 MIPS, at a speed of 8MHz. Today, the top-end *Intel Core 2 Extreme* processor handles an astounding 59,455 MIPS at speeds as high as 3.7GHz. Obviously, the days of sitting in the grey-bar hotel (prepress slang for watching grey progress bars crawl across the screen) are long behind us as the current state of hardware has long surpassed the demands of the prepress market.

Even the venerable Raster Image Processor (RIP) has evolved from its roots as an expensive, mysterious, sluggish and proprietary box to a modern software application that can run on any off-the-shelf desktop or laptop PC. Today, computer hardware and operating systems are being advanced by rich media like audio, video and

astounding 3D rendering required for gaming and shaping the virtual world. The simple rearranging of static pixels that define most prepress operations have become the new mundane.

So, these days, the answer to *how much* is enough really depends on what it is that you want to do. Designers creating static content for print and Web applications can be easily appeased with off-the-shelf Mac or Windows-based computers running the many software titles we all know and love. Even a 300-dpi 18 x 24-inch RGB Photoshop image weighing in at a hefty 111MB can be easily manipulated on a consumer-level laptop with little discernable hesitation. In addition, many complex prepress tasks such as preflight, PDF normalization and post-RIP imposition are now performed by scalable servers – the only user interaction being through a remote client application on a local workstation. As the MIPS are being performed elsewhere, there is little local need for more power on the desktop.

The OS dilemma

Basically, every prepress department runs whatever OS they need in order to process the files and meet the needs of their print customers – period. The dividing line around the once impenetrable Mac stronghold has become fuzzy as professional designers and content creators primarily use applications that are available on both sides of the OS fence. The files created by Windows versions of InDesign and QuarkXPress are virtually identical to their Mac counterparts – fonts still being the only divisive factor.

While the Mac continues to be the traditional favourite of designers worldwide, the widespread availability of inexpensive Windows systems and a growing shift of content creators to alternative forms of media has skewed the prepress-operating-system market considerably. Interestingly, Apple continues to aggressively gain market share and are now closing in on 10 percent of the global OS market.

Hardware – love hertz...

When choosing the ultimate prepress machine for your particular environment, do not spend too much time going over the merits and faults of specific brands. Instead, computer hardware destined for the prepress department should be assessed by the suitability of the components it is built from.

At the heart of the workstation is the processor, which can be compared to the engine of the system. As with all engines, the simple rule of more power = more speed generally applies. Processor speed is measured in gigahertz (GHz) and of course, the higher the better. Consumer computers run in the 1.5GHz to 2.2GHz range, while higher-end gaming or media machines can top out at more than 3.4GHz. Naturally, price will scale with speed. For the consumer, the processor question becomes a little more complex when multiple cores are thrown into the equation.

Instead of increasingly ramping single-processor speeds, chip developers such as Intel and AMD have developed single Integrated Circuits (IC) with more than one processor (core). Theoretically, a dual-core processor running at 2GHz could perform most tasks at the speed of a single 4GHz processor. I say theoretically, because many other factors such as OS and software application affect how a processor is utilized. Suffice it to say that again, more is better – if not for present needs, then for future use.

Do not worry too much, either, if you happen to come across the 32-bit or 64-bit question as the digital world is currently transitioning awkwardly between the two standards. These numbers refer to the width of the data pipe between the processor and the rest of the computer. Currently, most commercially available software is written in 32-bit code.

While the current incarnation of the Apple Mac OS X (10.5 Leopard) is technically a 64-bit OS, it seamlessly runs any application on older Macs with 32-bit processors. Microsoft Windows XP and Vista come in separate

versions optimized for 64-bit processors and require applications specifically written for the appropriate version. According to engineers from both Apple and MS, we are several years away from really benefiting from the promised speed of 64-bit addressing.

Thanks for the memory

Once an expensive barrier to productivity, memory has now become a cheap commodity item. While more memory does not make your computer faster, it does allow the processor to work more efficiently and operate at optimal speeds. Also, if memory intensive applications such as Photoshop are short of RAM, they will use hard disk space as virtual memory, greatly decreasing processing speed as information intended for RAM is exchanged with the disk. Two gigabytes is the least memory a prepress machine should have, and most savvy high-production shops will opt for the maximum supported by the computer. Memory prices will vary according to the shape, style and speed but a 2GB chip can often be acquired for less than \$50.

While we are on the topic of hard disk speed, most users do not realize just how much a slow hard drive can impact productivity. In reality many of the noticeable operational hiccups a computer user experiences during the course of a normal working day are the result of the OS swapping data with the hard drive. Disk speeds are measured in RPM, referring to the platter rotation speed in the drive. Consumer level laptop drives generally spin in the 4,200 to 5,400 RPM range, where higher performance drives range upward from 7,200 RPM. A faster disk reduces operator time gazing glassily at progress bars or beach balls.

The drive interface used to be a hotly debated point of contention in prepress circles, with most choosing the SCSI standard for the high-speed and stability of the connection. You can still buy SCSI drives, but they are expensive, lower capacity and offer little benefit other than psychological to the modern prepress workflow. Many a seasoned prepress pro will remember the

wasted days of their youth spent debugging flakey chains of SCSI devices while muttering magical incantations to the data-transfer gods.

The current standard for internal connection is SATA (Serial Advanced Technology Attachment) and offers fast and cheap data transfer. And just like you can never have too many closets in your house – you can never have too much storage. Disk space is very inexpensive these days with a SATA 1TB drive coming in at less than \$150.

Long overlooked by everyone in the computing community (except gamers), the quality of the graphics card is key to the prepress computer's performance. The graphics card (also called the video card, the display card, or the graphics accelerator card) is responsible for what you see on your screen, how fast you see it and how many screens you can see it on. Companies like NVIDIA and ATI dominate this market do not spare the "extreme" adjectives when naming their products. As prepress is a visually demanding and colour precise activity, it pays to consider the specification of the graphics card. Look for a high-end card with lots of onboard memory dedicated to video.

Assuming your graphics card can support one, another inexpensive productivity boost can be achieved by simply adding a second monitor to a workstation. A low cost 17-inch LCD screen as a secondary display allows a user the real estate to spread out the plethora of tool palettes and dialogs created by working simultaneously in multiple software applications, saving time.

Networking is another ghost from the prepress past that has ceased to haunt the beleaguered prepress user. Current networking technologies are stable and proven and have long since outstripped the data transfer demands of prepress. Leave the unstable, slow and non-secure wireless networks for the coffee shops and stick to good ol' gigabit Ethernet over Cat. 6 cables. Any seriously large amount of data transfer is best handled by sneaker-net anyways. (Sneaker-net being prepress slang for moving data between machines on a portable disk.)

Two boots better than one

When Apple iCEO Steve Jobs announced that the Mac would be migrating to Intel processors, there was a great deal of apprehension in both the Mac user and developer communities as to the wisdom of this move. Later, when Steve revealed the Boot Camp project, which would allow any Intel-equipped Mac to run Windows XP or Vista natively, his real intent became clear. This strategic move served to keep Apple's OS nemesis close at hand and expanded the Mac's market into business and the enterprise.

Running Windows on a Mac is by no means a new phenomenon. (I reported on the technology in *PrintAction*, April 2007.) Besides Apple's Boot Camp, another increasing popular technology for running a dual-OS Mac is to utilize virtualization. Inexpensive applications such as Parallels 3.0 and VMware Fusion 2.0 allow users to either use their Boot Camp partition without leaving the Mac OS or to create a completely new virtual machine and install any x86 operating system including Linux.

For users running dedicated Windows OS prepress applications on their Mac, such as RIPs and proofing software, Boot Camp is the more productive option. Because Apple supplies all the necessary drivers, native performance of Windows running in Boot Camp on an Intel Mac will be as snappy and responsive as though it was running on any similarly configured PC. In fact, shortly after Boot Camp's introduction, PC Magazine claimed the fastest Windows laptop on the market was an Intel MacBook Pro.

On the other hand, prepress users merely wanting to occasionally access Windows applications for document editing purposes, or perhaps to run a Windows-only workflow client, virtualization is the best option. Despite the small performance hit of running an operating system within a virtual machine, most users will gladly accept the sacrifice for the convenience of being able to share the desktop with two operating systems. Recogn-



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nizing the dual boot market shift, Quark has flexed its software licensing to allow an XPress user to run both a Mac and Windows installation from the same serial number.

As both Parallels and VMware Fusion mature, performance and transparency of activity between the Mac and virtual OS have improved to the point that the virtual machine has become a viable prepress tool.

Desert island prepress machine

Okay – enough with the theory already, time to get specific. Imagine your extreme scenario is being stranded on a desert island, waves lapping on the desolate shore and the odd seagull squawking as it circles overhead under a searing sun. After building a shelter, making a fire and catching a fish for dinner, your next thought naturally turns to prepress. Let's assume that you can have only one machine to run your desolate prepress shop – what would be inside that box?

The natural move would be to go for a dual boot machine so you can run both your design/page layout apps on the Mac side while you run the production on the Windows side. You might think that a Mac computer would be your only option, but you would be wrong. A young Florida-based company steeped in controversy opened their doors early this year. Psystar released their own line of low-price Intel computers offering a variety of operating systems pre-loaded, including Mac OS X Leopard.

Many thought that the Psystar OpenPro computer was a hoax as it offered significant workstation-grade components for a fraction of the cost of a similarly configured Mac. A few brave souls risked their credit cards, bought these machines and they started shipping within a few weeks of the company's launch. Apple was quick to file suit claiming Psystar was violating Apple's End User Licensing Agreement, and just as quickly, Psystar hired a lawyer and filed a countersuit claiming monopolistic

practices by Apple. The litigation is still active as of press time and Psystar is still shipping its Mac clones. User reviews are mixed, but a few of these machines are starting to show up in production environments.

Psystar has experienced its fair share of technical problems as well. Because Apple closely controls the chipsets within Macs and optimized the OS to take full advantage of that fact, Psystar is forced to remap many processes. Also, the end-user cannot use Apple's automatic software update services, as any change to the OS could effectively brick the Psystar computer, rendering it useless. Psystar has circumvented this inconvenience by building its own software update server, feeding tested and modified updates to its users.

Still, when stuck on a desert island, one does not want to take chances with a flakey computer. Psystar could literally vanish overnight under a tsunami of litigation, leaving users with dead-end hardware and no software upgrade path. Likewise, some savvy PC users have managed to get the Mac OS to run on a non-Apple Intel computer, but again performance is spotty and unreliable. When using a computer for mission-critical production work, some corners shouldn't be cut.

So, by default, the desert island machine would be a Mac Pro. Though the design and configuration is getting long in the tooth, this largish perforated aluminum workhorse is still the industry standard for design and prepress. Running dual quad core Intel processors, the Mac Pro delivers the power of 8 processors (subject to the aforementioned caveat). Eight slots afford plenty of space for RAM (up to 32GB), and multiple drive bays assure you can fill the machine with more than enough storage. Standard features include dual high performance graphics cards for robust dual monitor support and an internal RAID card.

Configuration would be fairly straightforward with Leopard on the main drive as well as a Boot Camp partition. Unfortunately, Boot Camp is currently limited to

running on a partition on the Leopard drive, the use of a secondary drive completely devoted to Windows is not supported. The Boot Camp partition would likely be home to a Windows XP installation as the greater PC community has been slow to migrate to Vista.

The ultimate desert island workstation would run virtual machines as well. Within the virtual machine, you might want to install Vista for the occasional job requiring a version of software only supported on Vista, or an older x86 OS such as Windows Server 2003 or Server 2000. If you load your ultimate machine with plenty of RAM, you should be able to run most Windows prepress applications within a virtual machine. Your ability to virtualize multiple operating systems is only limited by your available disk space, as these virtual machines can be stored anywhere on your workstation.

As for software, all the standards would be in order, taking into account that good prepress practices dictate you maintain at least one older generation of key applications in order to be compatible with your customers. Increasingly, other competing applications are making their way into the crowded desktop market, many competing rigorously on price. Serif Software's PagePlus X3 is an inexpensive option for page layout and is part of a suite of applications modeled on Adobe's Creative Suite. In spite of being a Windows-only application, PagePlus is nibbling away at the periphery of the desktop market.

So, with all desert island references aside, each prepress department will have a different idea of what constitutes an ultimate machine based on their unique production requirements. And now that digital prepress has matured and no longer stresses the modern workstation, we can save the *extreme* for the difficulties of figuring out how to properly leverage 59,455 MIPS through the World Wide Web to create touchless, template-driven production. ☺

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