PRESENTING

PowerPC

Here Comes World Peace, Convergence & Camelot, Too

By Gary Andrew Poole

L ike so many next-great-thing innovations, the PowerPC fuels intense flame wars on the Internet. And in Silicon Valley's few remaining fern bars, fistfights are practically breaking out over the microprocessor chip's floating-point integer performance. Supporters say that reduced instruction set computing (RISC) will give users "twice the performance at half the price with three times as many applications." Skeptics, like International Data Corp. analyst David Card, blurt out: "Anyone who believes all that is a moron. [Whoa, Card, relax.] The PowerPC has more things against it than for it." Card backs up that statement with IDC's prediction that the PowerPC–which admittedly is barely out of the factory door–has less than two percent of the workstation market now and only a blip of the PC market.

But do the people whose jobs depend on such technology–you know, *real* people, like MIS directors–really care about the PowerPC? And should they?

Just in case you've been preoccupied for the past two years handing out reactionary literature in air-

ports, we're talking about the joint effort from IBM Corp., Apple Computer Inc., and Motorola Inc. The PowerPC is a RISC microprocessor that the three have developed as a massive effort to end Intel's dominance of the $110-billion chip industry.

Its creators say it's the most open chip–ever. It will eventually run an unprecedented seven operating systems. It's slated to run on a wide range of computers, everything from subnotebooks to massively parallel mainframe-replacement servers. Moreover, executives from The Triumvirate claim they will ship one million PCs and 200,000 workstations in 1994. Furthermore, the chip's proliferation makes convergence maniacs coo with joy because it proves that

Can one fast RISC chip change the future of computing? IBM, Apple, and Motorola are betting that their chip has enough muscle to capture and convert Unix workstation and Intel PC users

workstations and PCs can "impersonate" each other. So why are many of the world's MIS directors yawning?

First, something like 80 percent of users in large corporations have Intel-based PCs running Windows. And they use the machines for word processing, spreadsheets, and communicating with colleagues. Needless to say, it's hard to justify buying new machines simply because they will run multi-processing and multimedia software when the need, for most users, is just not there. Not yet. Yes, it makes the life of a commodities broker that much easier if he or she can see the ticker while unloading orange juice futures. And, sure, there are others who would love to see and hear their bosses tell them in the splendor of full video and audio what a lovely job they're doing. We know that multi-whatever has benefits for your users, but most PC users don't yet need such a powerful computer on their desks.

An additional concern is the hassle of adding yet another microprocessor architecture to the enterprise. MIS people want to simplify their lives, not spend torturous weekends in their offices trying to configure and reconfigure the network while their little girl grows up, their significant other gets old, and the New Jersey Nets enter the play-offs.

Says Jim Ducatelli, a director at J.C. Penney Co. Inc.'s advanced information technology division and a PowerPC beta tester: "Ultimately we might be interested in the machines, but for now we're in absolutely no rush. We want to be careful not to split [our network in] too many places."

Okay, so we've pointed out some reasons not to love the PowerPC. But for every shortcoming about the new chip, there's something that makes it almost

the perfect solution for forward-leaning MIS people in certain situations, which may account for the current, generally accepted first-year sales projections of 1.2 million units.

The first major, major issue: the PowerPC protects your investments in legacy desktop applications. Only a fool would turn his or her back on the Intel architecture and the jillions already invested in applications, not to mention the time spent learning them, configuring them, and so forth.

The second major issue: there's the growing fear that CISC technology is an out-and-out dead end. An obvious question is, why haven't other RISC architectures raised expectations the way the PowerPC is now raising them? The answer is that The Technotrinity's size and clout (diminished as it is) is enough to set an industry standard based on market volume.

So they're selling this new technology on the basis that it protects one's investment, provides a better price/performance ratio than Intel, and has the power for compute-intensive uses. (And think what it will mean for Mac users who want to get some *real* performance for a change.)

And the bottom line is: if you are an MIS director who wants to hang on to your job for only one more year, don't even bother with the PowerPC because its true benefits won't have accrued for at least a couple of years. But if you are in a position to plan for the long term, to consider the needs of your organization for two years and beyond, you would be wise to set up a test group to evaluate the PowerPC for the day when it *will* have next-generation applications and operating systems. And be prepared for the impending convergence of PCs,

Where PCs and Workstations (Finally) Converge

Over the past few years, PCs and workstations have been on a collision course—PCs have gained power and networking capability, while workstations have gained productivity applications and dropped in price. IBM, Apple, and Motorola hope that the PowerPC will give users the best of both worlds.
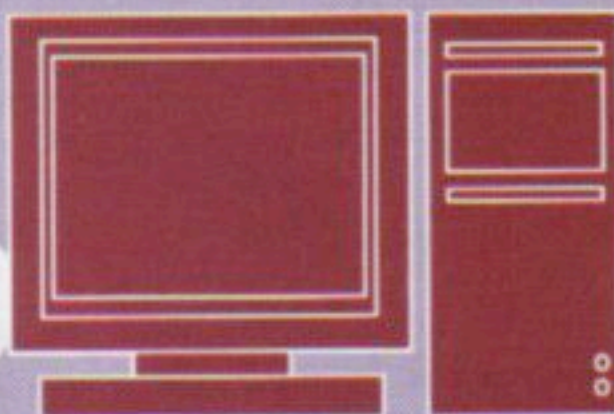
PCs
- 16-bit, single-user, single-tasking applications
- Popular personal productivity, off-the-shelf applications
- Industry standard platform
- CISC CPU, low-resolution graphics
- File-server networks
- "Client" in client-server networks
- Low cost, high volume

$1,000-5,000

PowerPCs
- 32-bit multitasking applications
- Scientific, engineering, mission-critical applications

- Popular personal productivity, off-the-shelf applications
- Good resolution graphics
- Could become an industry standard if price and performance can create a high-volume, low-cost super-PC

$3,000-7,000

Workstations
- 32-bit multitasking applications
- Scientific, engineering, mission-critical applications
- Vendor-standard platforms
- High-resolution graphics
- Client AND server applications
- High cost, low volume
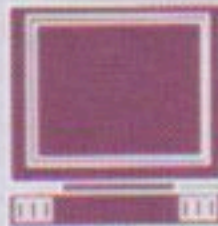
$5,000-50,000

workstations, and 32-bit operating systems.

Convergence

Deep in the heart of Texas there's a building they call "Somerset." If you ask a local what the name means, you're apt to get a blank stare. But to a bunch of super-brainy chip designers and to three power-hungry executives, Somerset conjures up images of world domination in the computer industry.

As a result of the goings-on behind these walls, the world of computing will change forever. That's what IBM, Apple, and Motorola would have you believe. And that's why, in a fit of optimism, they named this place Somerset. Remember King Arthur's Knights of the Round Table? Those were the guys of legend who wore shining armor and governed the Eden-like kingdom of Somerset.

In 1988, these three leading computer companies plotted to take back the industry they had once held in their clutches. Here in an Austin office park, near a Hooter's restaurant, men in pickup trucks drive by Somerset, their radios blaring country-and-western ballads like "She Is the Queen of My Double-Wide Trailer." It is the exact spot where IBM, Motorola, and Apple plotted their revenge through what they hoped would be a major movement in the computer industry, the convergence of PCs, workstations, and 32-bit operating systems.

But is it the *real* convergence? It's true that PCs are gaining in power while workstations are dropping in price. But it doesn't necessarily follow that your average PC buyer will gobble up workstations and your workstation user's going to pick up a PC.

In a way, what IBM and friends call a convergence is simply a way for buyers to have a uniform line of the vendor's machines to replace the variety of platforms they probably now have in place. "People have heterogeneous networks," says Bill Filip, IBM vice president and general manager for its RISC System/6000 Division. "But people are dreaming about a homogenous network. The PowerPC will give them the ability to have such a network."

Traditionally, PCs and workstations have been used for distinctly different purposes. With the exception of databases, folks have mostly relied on PCs for standalone tasks—like writing memos and running spreadsheets. Even those with PCs networked together for companywide electronic mail and file sharing barely make it beyond the memo-writing and spreadsheet stage. Workstation users—the high-performance RISC crowd of tech-heads who write code, develop products, and analyze data—have always used sophisticated, usually difficult-to-master, applications.

True, all that is changing, but the true convergence won't happen until there are low-cost, high-performance machines (like the PowerPC) that also support industry-standard personal productivity tools and incorporate the coming wave of multimedia applications.

So, in a way, buying a PowerPC box to run non-multimedia applications now is like putting a Harley-Davidson motorcycle engine on a trike. There's too much power for what you need it for. However, The Troika might be sitting pretty for 1995 or '96, when more complex software will be introduced from mainstream providers.

Even if the software exists, the market may not really blossom until clone makers like Compaq Computer Corp., Dell Computer Corp., Gateway 2000, and Packard Bell get into the act, as they are likely to do. Companies tend to take the joint efforts of large entities like the IBM-Apple-Motorola trio seriously–together they already control 25 percent of the PC market. But cloning isn't going to happen overnight.

Compaq, which owns five percent of the PC market, seems like the least likely PowerPC adopter. It has a long-standing, and solid, relationship with Intel. Dell et al have less to lose. But Dell spokesperson Dean Kline isn't making space in the Dell catalog yet. "At this point we don't see any demand for these products," he says. "None. The majority of our customers want a computer that runs Windows. That's all they care about."

Another company shares Kline's view. "We've investigated the chip, but we don't see a fit in our product line at this time," says Rus Graham, Gateway 2000's product line manager. "Less than 10 percent of our users care about operating systems other than Windows. Maybe that will change down the road, but not for now."

IBM's Bill Filip has his own idea of the time frame. "They will probably have PowerPC-based machines by the end of 1994," he says.

And what about Intel, the computer industry's version of a superpower; should it worry? "Intel isn't threatened," says Andrew Allison, editor of the newsletter *RISC Management*. "Eventually, when there's some systems out there, Intel will be threatened at the margin level [at which they operate]. It might even have to lower its prices." Intel can drop its prices any darn time it wants, as it proved on December 21, 1993, when it announced price cuts of between 14 and 18 percent to take effect in the second quarter of this year.

MIS Reaction

What The Threesome fears is some hesitation from MIS directors, who may not see an immediate need for the machines. The group craves some momentum so software vendors won't get scared. It dreads comments like these: "So the PowerPC saves us $400, big deal. If we start buying PowerPC machines, we have

Apple plans to release systems based on the PowerPC architecture and provide upgrade paths for several existing machines.

A History Lesson

Just about three years ago, former Apple Computer Inc. Chairman John Sculley, former IBM Corp. Chairman John Akers, and former Motorola Inc. Chairman George Fisher (all of whom are now history) met to make an agreement, which some people thought was a shocking pact. The fierce rivals, to help their dwindling margins, made an alliance.

IBM and Apple set out to build the PowerPC and start two companies: a multimedia venture called Kaleida, which has struggled, and Taligent, a company focused on building an object-oriented operating system. The agreement showed how far the computer industry had come and how different it had become. Computer companies were no longer the rulers, but rather chip companies (Intel Corp.) and operating-systems hawkers (Microsoft Corp. and Novell Inc.) were the new leaders.

Through the agreement, IBM and Apple aspired to take back the industry they once owned by developing a new standard chip and operating system for the future.

Now, in 1994, the companies' agreement has started to materialize into actual products. While the IBM-Apple-Motorola pact was one of the biggest news events of 1991, the PowerPC will be the most important product introduction of 1994, says Ken Ow-Wing, an analyst with research firm International Technology Group. Not only will it affect the market, it will impact users who need to make critical decisions, including letting Apple machines into the corporate enterprise; putting new operating systems into a company's enterprise; and seeing whether the PowerPC, despite its drawbacks, gives the network enough advantages that it should land in users' buying plans.

to change MIS' direction. We'll study the PowerPC, but we won't take it too seriously. Intel is simply an easier choice." Those less-than-encouraging words come from Ron Hill, director of telecommunications for G. Heileman. Hill happens to be in charge of buying desktop machines for the brewer, which grosses $900 million in annual revenue.

To counter MIS resistance, the three companies are making a short-term technology argument: Users need RISC on their desktop because it's great technology. The PowerPC processors are based on IBM's existing POWER (Performance Optimized With Enhanced RISC) architecture used in RS/6000s. With a higher performance chip, more compute-intensive applications will be able to run. So instead of spending $10,000 for a RISC workstation, you'll be able to buy a $5,000 PC that does the same thing. And it will run a lot of operating systems—Apple's System 7; IBM's OS/2, Workplace OS, and AIX; Sun Microsystems Inc.'s Solaris; Microsoft's Windows NT; and Novell Inc.'s Unixware. The two operating

systems that most desktop users truly care about–DOS and 16-bit Windows–will run (take a deep breath) via emulation.

Exhale.

Now, believe it or not, the emulation software is receiving rave reviews (see page 101). In a nutshell: most productivity programs written for Intel-based platforms and 680X0-based Macs will run at close to native speeds. But will the running of desktop legacy applications in emulation–which raises a host of training and support problems–satisfy users?

Another acid test for emulation of legacy applications is interoperability, as demonstrated by the ability to cut and paste between applications, on the desktop, that run on different operating systems. Thus far the capability testing that would convince MIS that emulation is a viable strategy has been extremely limited. Yet another unknown is how the PowerPC-based systems will operate in a heterogeneous environment. More to the point, will there be the capability of true inter-application communication? (See "Not another Unix?!")

Workstations: Blue-Light Special

The workstation market is small compared with the PC market, but still it represents $12-billion worth of computers, according to McKinsey & Co. That's where IBM wants to generate some initial momentum.

And it's where Intel concedes that the PowerPC will do well.

"The business we lose to the PowerPC is business we've never had," says David House, a senior vice president at Intel. "We've never really competed against IBM's workstation line." The Santa Cruz Operation Inc., which has a lot on the line because all of its products are Intel-dependent, is evaluating the chip. SCO will likely announce plans to port to the PowerPC sometime this year.

On September 21, 1993, IBM announced four new machines for its RS/6000 line. The machines–the Powerstation 25T, Powerstation 25W, Powerserver 25S, and the base 250 system unit–were the first workstations developed from the alliance, and they proved to have good floating-point performance, an important feature for multimedia, graphics-intensive, and other emerging applications. Observers gave the machines solid marks. And purchasing the machines is a no-brainer for IBM users who want high-performance machines that run Unix.

So competing workstation vendors fear MIS will buy PowerPC-based machines because they can run multiple applications. To gain access to desktop productivity applications, some engineering departments maintain PCs on engineers' desks, right alongside the workstation. Eliminating the PCs could save a lot of money for such companies.

Take this scenario an analyst provided: Say an MIS department has 30 workstations in engineering; the

hardware costs about $300,000. Then if you add 30 PCs for basic word-processing and number-crunching tasks, that's an additional $100,000. That still doesn't take into account the two different software and training packages for each machine, which could mean an additional $75,000. All told, the MIS department has spent $475,000 on machines and software when it could have bought one hardware system that runs a plethora of operating systems and applications. If that same user bought PowerPC machines, they would probably cost—for hardware and software—$350,000.

The Future: What Will Happen

The PowerPC may be slow out of the gate, but its initial problems will fade as operating-system kinks are worked out.

"IBM must demonstrate the value of the platform," says Tom Kucharvy, president of research firm Summit Strategies. At the Fall Comdex show, IBM officials announced that future PowerPCs will accept, and act on, commands via voice, touch, and pen. IBM demonstrated the "human" interface and told attendees that they would begin shipping developmental systems to software vendors in 1994. Kucharvy says these kinds of next-generation software could enable the PowerPC to outclass its competitors.

"It's a good way to differentiate its products," concludes Kucharvy, "but it will be a niche interface for a long time."

Just how long that will be depends on whether MIS people feel they get satisfactory answers to such questions as: Does this machine run my existing applications? Is it cheaper? Initially, the PowerPC will run some existing applications, but it won't necessarily be less expensive. As more machines are shipped, however, the prices will fall. Expect machines with comparable prices to Pentium-based machines in 1995.

What You Should Do

So the PowerPC can save an MIS shop money, but the industry analysts we interviewed for this story advise caution. They say there might be short-term cost benefits, but they also say they're looking forward to the day when The Ménage à Trois can give more guarantees to users regarding the PowerPC's openness and long-term viability.

Here's what they recommend:

• Make sure IBM provides you with an upgrade path for its machines.

• Wait. Test the machines. The PowerPC isn't so ground-breaking that you're going to have to throw out all your machines. Nevertheless, you should start a pilot test now.

• Start small. Buy a few machines and integrate them into your network. If you're like most MIS shops, you have islands of Macs, PCs, and workstations. In theory, the PowerPC can bridge those islands, but don't just buy a bunch of PowerPC-based machines running Windows.

• Wait for clones to arrive. *If* there are clones on the market, that's a good sign that there's some widespread acceptance. It shows that other vendors have bought into the technology, and you won't get locked into a cell with IBM and Apple.

• And finally, stay consistent. Just because you can choose from seven operating systems on PowerPC-based machines doesn't mean you want to run them all. Otherwise, your MIS staff will be pulling—what's left of—its hair out, your users will be downright confused, and you might be looking for another job. ∎

Proponents of the PowerPC platform know that one thing will make or break them in the computer market: application software.

If application developers move early to support the PowerPC by rewriting their products to run in native mode, Apple Computer Inc., IBM Corp., and other system vendors will get an incredible boost. PowerPC system buyers would also benefit from a wide choice of legacy and new applications from which to choose.

But the PowerPC system mavens face a major obstacle: Independent software vendors (ISVs) may be put off by the same variety that others may find so attractive.
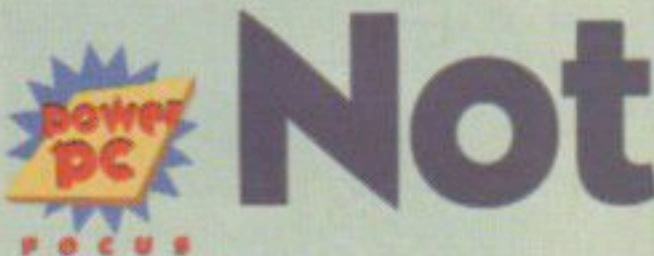
The fact is that for many ISVs, the cost of porting, maintaining, and supporting multiple versions of an application is prohibitive.

The remedy devised by PowerPC vendors involves yet another attempt to create standards in the fractured Unix world. Following the model of 88open Consortium Ltd., an earlier industry group created to promote the Motorola 88000 processor, Apple, IBM, and Motorola Inc., have joined with Groupe Bull, Harris Corp., Tadpole Technology Inc., and Thomson-CSF to form the Poweropen Association Inc., based in Burlington, Mass. The companies in this group have defined a set of binary-level specifications based on IBM's AIX but adhering to industry standards such as Posix, X/Open Co. Ltd.'s Portability Guides (XPG) and Open Software Foundation's Application Environment Specification (AES).

The Poweropen environment's application binary interface (ABI) also supports two graphical user interface extensions: Motif and Macintosh. Furthermore, Poweropen's ABI is totally bus-independent, so that it will work with VME, Microchannel, NuBus, and other bus architectures.

Even though Poweropen's ABI was derived largely from AIX, the Poweropen