PowerOpen Association
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Apple Computer, Inc.
Q&A
Final

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OVERVIEW - MARCH 9 ANNOUNCEMENT

Q. What is being announced on March 9?
• POA -- structure; services
• POA president (Domenic J. LaCava) (see POA documents for LaCava bio)
• Technical details of the PowerOpen Environment
• POA founding members: Apple, IBM, Motorola, Bull, Harris, Thomson-CSF, Tadpole Technology)
• POE endorsers (OEMS, software developers)
• Proof of concept: Demo of Macintosh Application Services

POWEROPEN &....

APPLE CUSTOMERS

Q. How do Apple customers benefit from PowerOpen?
A. Apple customers who choose PowerOpen will benefit in three ways:

1. PowerOpen allows customers to run Macintosh applications on top of a UNIX-based operating system. Apple customers who choose PowerOpen will be able to run the affordable and easy-to-use existing Macintosh applications as well as UNIX applications. These applications will run unmodified in the PowerOpen environment.

This means that PowerOpen dramatically expands the portfolio of applications available to Apple customers who choose PowerOpen. It also means that Apple customers will be able to preserve their investments in existing 68k Macintosh applications.

2. Apple customers who choose PowerOpen will find that their existing 68k Macintosh applications have the same look and feel on PowerOpen-compliant systems as they do on 68k Macintosh systems. In addition, PowerOpen users will be able to take advantage of many of the same features of the 68k Macintosh environment, including file management features such as cut-and-paste. As a result, PowerOpen customers will be able to cut and paste between Macintosh applications and UNIX applications.

3. Apple customers who choose PowerOpen will find that their existing 68k Macintosh applications will run at breakneck speed in the PowerOpen Environment, thanks to the high-performance PowerPC microprocessor and advanced Apple software technology included in the PowerOpen environment. (Our performance target is that the Macintosh applications will run at least at Quadra 700 speed. We will be able to provide more specific information on this when we complete performance testing.)

POWEROPEN &...
APPLE DEVELOPERS

Q. How do Apple developers benefit from PowerOpen?
A. PowerOpen provides new, high-volume business opportunities for Apple developers. With the advent of PowerOpen, 68k Macintosh applications will be able to run on PowerOpen-compliant systems from Apple and also from IBM, Bull, Thomson-CSF, Tadpole Technology, Harris, and future PowerOpen Environment adopters. This means that PowerOpen continues to expand the market for Macintosh applications and thereby provides a growing market for third party Macintosh developers.

Q. What should developers do to take advantage of the PowerOpen opportunities?
A. To take advantage of the opportunities afforded by the PowerOpen Environment, developers should continue building System 7 applications. These applications will be compatible with PowerOpen-complaint systems. By conforming to the PowerOpen ABI, software developers will ensure that any products they deliver will function properly across PowerOpen-compliant systems from different systems vendors.

Q. Why hasn't Claris endorsed the PowerOpen Environment?
A. Claris intends to endorse the PowerOpen Environment very shortly.

Q. What about other Apple ISVs that are not here today to endorse the POE?
A. We are working very aggressively to continue obtaining additional endorsements from many ISVs. We expect additional endorsements in the coming weeks and months. This is an ongoing process.

POWEROPEN &...
APPLE

Q. How does Apple benefit from PowerOpen?
A. That question really involves several different topics. Therefore, we can address that question from a number of different angles.

-- The Apple/IBM Alliance
Keep in mind that the development of a new UNIX operating system was one of the five initiatives announced by Apple and IBM in Oct. 1991. Overall, Apple entered into the alliance because it furthers our strategy of increasing market share and becoming a bigger, more influential player in the industry. All five initiatives, including PowerOpen, support these goals.

-- PowerPC
Another of the five initiatives announced by Apple and IBM, along with Motorola, was the development of a new family of RISC-based microprocessors called PowerPC. PowerPC offers substantial performance improvements over the 68k series of microprocessors. Not only will PowerPC provide substantial performance improvements to the Macintosh, it also enables advanced technology such as speech recognition. Keep in mind that PowerPC-based Macintoshes will ship with System 7 -- not Apple's version of PowerOpen. PowerOpen will be an option for PowerPC-based Macintoshes, as A/UX is today for 68k Macintoshes.

-- PowerOpen
The development of a new UNIX operating system that is both powerful and easy-to-use will strengthen Apple's competitive position in the growing open systems marketplace. Apple already has a presence in the open systems market with A/UX. PowerOpen will enhance our presence in the open systems market and attract additional Macintosh sales in this market.

-- PowerOpen Association
As part of the PowerOpen announcement in Oct. 1991, Apple and IBM announced that they would form an association to promote the PowerOpen Environment. Apple benefits by its participation in this association by leveraging its resources and experiences with those of other members. In short, Apple's participation in the POA makes Apple more competitive.

Q. It seems that Apple is bringing much more to the PowerOpen table than IBM. Is that accurate?
A. We consider this to be a very equitable partnership. We're bringing a lot to the PowerOpen table and to the overall Apple/IBM/Motorola alliance, and we're receiving a lot as well.

Q. Specifically on PowerOpen, what does Apple get?
A. IBM's AIX is a proven, robust UNIX operating system that, together with Apple's contributions, will enable Apple to deliver a world-class open systems environment. As part of the Apple, IBM, Motorola alliance, Apple and its customers will benefit from the availability of the PowerPC microprocessor.

Q. If a customer can run existing 68k Macintosh applications and have the Macintosh environment on something other than a Macintosh -- say, a PowerOpen-compliant system from IBM, Bull, or Thomson-CSF -- why would they need to buy a Macintosh from Apple?
A. Apple will differentiate its PowerPC systems from other PowerOpen-compliant systems by adding unique and compelling features and capabilities, as we have with our 68k-based Macintoshes.

Q. Isn't Apple concerned that it has, in effect, given away its key differentiation in the marketplace -- the consistency and simplicity of the Macintosh?
A. Quite the opposite. Apple has expanded its unique offerings to other environments. We've simply provided a solution to a new segment of the market -- the open systems market.

We have licensed part of our technologies to IBM as part of a series of agreements so we can work together to cultivate business opportunities and provide better solutions for our customers.

Apple, like many companies today, is continuing to investigate new areas of opportunity to leverage our core competencies in technology. PowerOpen represents one of the ways Apple will do this.

POWEROPEN ENVIRONMENT -- TECHNICAL DETAILS

Q. What is included in the PowerOpen Environment?
A. The PowerOpen Environment combines leading edge hardware and software technologies to form a new open systems environment. The hardware component is PowerPC, a RISC-based microprocessor technology. The PowerOpen software includes an operating system and, optionally, a graphical user interface that complies with the PowerOpen Application Binary Interface (ABI) Specification. Two GUI choices are available: either the Open Software Foundation's Motif or Apple's Macintosh interface.

Q. What hardware configurations will the POE run on?
A. The POE will run on a wide range of hardware systems, from notebooks to multi-processor workstations and servers.

Q. What applications are expected to run on PowerOpen-compliant systems?
A. Applications that run today on 68k Macintoshes, as well as IBM's AIX/6000, Bull's BOS/X, and Thomson-CSF's UNI/XT are expected to be able to run on future PowerOpen-compliant systems from Apple, IBM, Bull, Harris, Tadpole Technologies, and Thomson-CSF. PowerOpen's goal is that "shrink wrapped" applications will run without modification on PowerOpen-compliant systems from all these vendors.

Q. Why are there two GUIs that are part of the PowerOpen Environment?
A. We recognize that many companies that have standardized on open systems have chosen Motif as their GUI. For customers that have not standardized on a particular graphical environment, we will encourage them to use Macintosh.

Q. What does the PowerOpen Environment consider a GUI to consist of?
(Tims and Chow to provide answer to this.)

Q. Can the Macintosh run the MOTIF interface?
A. Absolutely. The Macintosh allows customers today to run the MOTIF interface with a third-party product, and will continue to allow customers to do so in future platforms.

Q. Will the Macintosh and Motif/X GUIs work in the same screen?
A. Applications may run simultaneously using any combination of the Macintosh or Motif/X GUIs. Character-based applications may also simultaneously run via X-Windows.

Q. What advantages does the Macintosh interface have over the Motif interface?
A. Motif, X-Window System, and other UNIX-based GUIs do not have the maturity, ease of use, or capabilities of the Macintosh interface, including its substantial networking capabilities.

Q. What is the PowerOpen ABI Specification?
A. The PowerOpen ABI Specification is a set of documents that describe the standard interfaces to an operating system and to the graphical user interfaces. The PowerOpen ABI specification contains both application programming interfaces (API) and processor specific information as well as interface specifications for AIXwindows and other extensions such as networking and systems management. It provides details on how to write a program so that it will run across multiple PowerPC platforms.

Q. Does the PowerOpen ABI include the Macintosh API?
A. Yes. It includes major components of the Macintosh API. These components are found in Inside Macintosh and will be enhanced with revisions of Inside Macintosh, as well as with additional documents produced by the POA.

Q. What is defined in the Macintosh API specification?
The Macintosh API Specification defines the commands and parameters passed between a Macintosh application and the Macintosh Application Engine in the PowerOpen Environment, as well as the look and behavior of the application. The Macintosh Application Engine Specification describes the necessary information to allow a Macintosh application to run unmodified on all platform conforming to the specification.

Q. Will PowerOpen run on other RISC chips, e.g. Alpha?
A. No. PowerOpen will only run on PowerOpen-compliant systems, i.e, systems that use the PowerPC chip.

Q. Will all Macintosh applications run in the PowerOpen environment?
A. We are confident that the most popular Macintosh applications will run in the PowerOpen environment. Apple will test the top 20-30 applications. In addition, we will provide test suite methodologies to test for compatibility of these applications in the PowerOpen environment. We also will work with ISVs to help ensure that their applications will run in the PowerOpen environment.

Q. Won't native 68k applications run slower in the POE environment than they would in the 68k environment?
A. No. Thanks to the extra horsepower in the PowerPC chip and advanced software technology provided within Macintosh Application Services, they will run at least at Quadra speed under PO. (Our performance target is that the Macintosh applications will run at least at Quadra 700 speed. We will be able to provide more specific information on this when we complete performance testing.)

Q. How does the Macintosh running on the PowerOpen Environment differ from an emulator?
A. Macintosh Application Services will be a translation of the Macintosh toolbox running native on the PowerPC instructions. While there will be some emulation of Macintosh 680x0 application binaries, the PowerPC chipset for the Macintosh will offer such high performance that emulation will be completely transparent to the user.

Q. What networking extensions will be available for Macintosh in PowerOpen?
A. Networking extensions will be available to Macintosh applications through AIX. Motif/X, through AIX, supports many of the most common network facilities found in open systems and distributed computing environments including NFS, STREAMS, TCP/IP, DCE, and DME. Initially, AppleTalk will be available only on Ethernet via TCP/IP.

Q. The POA has said that Windows applications -- as well as DOS and OS/2 -- applications will be able to run on PowerOpen systems, if an emulator to support their execution is developed. Is that likely to happen?
A. Individual members of the POA can enhance their offerings through any number of third party technologies. We anticipate that at some time, one or more of those vendors will incorporate a Windows emulator.

Q. Will Windows interface will be one of the interfaces that will be included in the PowerOpen Environment along with Macintosh and Motif?
A. Currently, Windows is not included as one of the optional GUIs in the POE. If sufficient demand warrants that the Windows interface be included in the POE, POA members can vote to have it included as an option.

Q. Are PowerOpen and Windows NT competitive?
A. (answer supplied by POA): PowerOpen is intended to be the best RISC-based applications environment in the industry.

Q. How does PowerOpen compare to Windows NT from Microsoft?
A. Apple believes that PowerOpen is the ideal computing environment for customers who want open, next-generation client-server systems. It combines the best productivity applications available with the most powerful open enterprise operating system. Many customers, especially those in enterprise environments demand open, standards-based systems; PowerOpen is for these customers. Unlike Windows NT--a proprietary operating system designed and marketed primarily by Microsoft (in large part to address the needs of customers who cannot work within the limits of DOS and Windows)--the components of PowerOpen are available today. Customers already know how to work with UNIX, it's not a disruptive transition, and it's proven, safe, open technology.

Q. Will Windows NT run in the PowerOpen Environment? On PowerPC?
A. Since Windows NT is developed and marketed exclusively by Microsoft, we cannot say whether it will choose to license PowerOpen technology or adapt its operating system to run on the PowerPC architecture.

Q. Is Microsoft going to port NT to a PowerPC chip?
A. That question should be directed to Microsoft.

Q. Are other companies going to port NT to a PowerPC chip?
A. Any answer would be speculation.

Q. Is Apple publishing its API?
A. Inside Macintosh represents the initial version of the API we will use in the PowerOpen Environment. It also will represent a framework that will be enhanced by providing additional descriptions or by developing additional documents that will further describe the API.

Q. Will the POE be compatible with Taligent?
A. POE adopters are concerned with protecting their customers' investments, while migrating to future technology. Compatibility between Taligent's object technology and the POE will be among the key considerations as it evolves, but it would be premature to make detailed comparisons at this time.

Q. Will multi-media technology from Kaleida be incorporated into the POE?
A. The POE will evolve as IBM, Apple and the system developers who have adopted the environment concur on the requirement to include new technology. It is premature to speculate on the role Kaleida technology will have in the Environment.

MACINTOSH APPLICATION SERVICES

Q. What is Apple contributing to the PowerOpen Environment?
A. Apple is contributing an important function to the PowerOpen
Environment -- Macintosh Applications Services (MAS).

Q. What is MAS?
A. MAS is an extension to the PowerOpen environment that lets PowerOpen
users take full advantage of a Macintosh environment -- the Macintosh user
interface; Macintosh System 7 software; the wide range of Macintosh
software applications and the Macintosh file management capabilities.

Q. What does MAS consist of?
A. MAS is made up of three distinct components (1) the Macintosh user
interface; (2) the Macintosh Application Engine (3) Macintosh System
Software.

The Macintosh user interface is the component with which users interact
with MAS. The Macintosh Application Engine includes the toolbox; a 68040
emulator; and a multimode switcher that allows both 68k applications and
native PowerPC applications to run simultaneously.

The Macintosh system software component maps fundamental tasks and
services such as memory management and Input/Output to files and devices
to the underlying PowerOpen ABI compliant operating system.

Q. What does MAS provide to PowerOpen users?
A. MAS provides the ability for PowerOpen users to run existing 68k
Macintosh applications and UNIX applications on PowerOpen-compliant
systems and take advantage of the Macintosh environment -- the graphical
user interface, System 7 software, Macintosh file management capabilities
including cutting and pasting between Macintosh and POE documents -- and
combine these advantage with the power, speed, and open system
architecture of a PowerOpen-compliant system.

Q. When will MAS be available?
A. MAS will be available n 1994. Further details regarding pricing and
availability will be announced at a later time.

**Q. Will data-only "cut-and-paste" functions between AIX or BOS/X
(Motif/X) be supported?**
A. MAS will support cut and paste between two Macintosh applications and
between Macintosh applications and Unix applications, just as Apple's MacX
and A/UX do today.

Q, Will "publish and subscribe" be supported?
A. (answer to come.)

Q. Will Macintosh Application Services -- and therefore existing 68k Macintosh applications -- run on an IBM RS6000?
A. No. The RS6000 is not a PowerOpen-compliant system. It does not use the PowerPC chip. The demo at the March 9 announcement, which shows Macintosh Applications Services running on an IBM RS 6000, is a prototype used for demo purposes only.

Q. Do PowerOpen users have full access to all of System 7 capabilities?
A. MAS contains major components of System 7. However, PowerOpen users will not have full access to all capabilities of System 7 software capabilities. For example, PowerOpen users are not able to take advantage of all the device drivers in System 7.

Q. From whom do you obtain MAS, when it becomes available?
A. MAS will be available from Apple and from systems vendors who license from Apple. As of today, IBM is the only systems vendor who has licensed MAS from Apple.

Q, Does obtaining a license from Apple provide systems vendors with the right to both use MAS in their own systems and license MAS to other systems vendors?
A. Yes.

Q. Have other systems vendors talked with Apple about licensing MAS?
A. Yes. We have had discussions with Bull, Thomson-CSF, Tadpole Technologies, and Harris. Obviously, any systems vendors that intends to develop and market PowerOpen-compliant systems will want to license MAS since it is an important function in the PowerOpen Environment.

Q. Do systems vendors have to be a member of the POA to license MAS?
A. No. However, the company must be a PowerOpen-compliant vendor, meaning that it has to support the PowerOpen operating system and PowerOpen ABI, as well as be shipping PowerOpen-compliant systems.

Q. Does licensing MAS mean, in effect, that Apple has endorsed the creation of Macintosh clones?
A. No. Remember -- what MAS provides is the ability for PowerOpen users to run existing 68k Macintosh applications and UNIX applications on PowerOpen-compliant systems and take advantage of the Macintosh environment. This is clearly not the same thing as being able to produce a system that is compatible with the Macintosh.

Q. Since IBM can license MAS to other systems vendors, does that mean Apple will receive royalty payments from IBM?
A. Yes. However, the details of this arrangement are confidential.

Q. Will Apple receive royalties from customers who license MAS through IBM, or other systems vendors?
(answer to come from Tims.)

Q. Will Apple upgrade MAS to coincide with future enhancements to System 7?
A. Yes.

Q. Does this mean that IBM, as well as other systems vendors that license MAS from either Apple or IBM, will automatically obtain enhancements to the Macintosh operating system?
A. No it does not. This is a matter that will be negotiated by Apple.

Q. Will Apple automatically receive enhancements from IBM to its AIX/6000 operating system?
A. No.

Q. Will MAS be licensed by other UNIX systems vendors such as Sun?
A. As long as they comply with the PowerOpen environment, there is no reason why they could not obtain a license. To reiterate, being PowerOpen-compliant means they will ship systems based on the PowerPC chip; that they subscribe to the PowerOpen ABI; and that they are running a variant of the PowerOpen operating system.

Q. Are there any technical reasons why Macintosh Application Services would not run in other UNIX environments aside from PowerOpen Environments?
A. There are some technical constraints to prevent it from being supported in other operating system environments. For example, native Macintosh PowerPC applications will not run in other UNIX environments without some additional coding. To explain this further -- Sun uses a different chip set than PowerPC. Therefore, native Macintosh applications would use a different compiler than you would use on a Sparc. As a result, some type of emulation would be required.

Q. Other companies such as Quorum have announced tools that allow Macintosh applications to run on AIX and other UNIX platforms; what is the advantage of MAS versus the Quorom technology?

A. Although we will not comment specifically any one vendor's products, generally speaking competitive products generally will lack the full range of features and tight integration to perform adequately in an open systems environment. Competitive products also do not comply with the PowerOpen Environment or with Apple standards for look-and-feel and operations.

APPLE 'S POWEROPEN IMPLEMENTATION

Q. Will there be one PowerOpen that Apple and IBM will jointly market?
A. No. Apple and IBM each will market their own versions of PowerOpen. Apple and IBM's PowerOpen implementations will be developed and sold separately by each company, even though they will share a common PowerOpen Application Binary Interface (ABI). Keep in mind that PowerOpen in and of itself is not a product. It's a technology foundation.

Q. Is PowerOpen a combination of Apple's A/UX and IBM's AIX offerings?
A. We are not combining our products—we are combining our efforts to create the world's premier, UNIX operating systems. Combining the strengths of the two companies will result in an operating system environment that no single vendor is capable of creating. IBM brings a unique understanding of distributed, standards-based solutions to this endeavor. Apple brings the ability to create the industry's best computing environments for the user and a proven ability to make complex software systems run in cost-effective, small memory configurations. In addition, users will have access to the broadest range of applications on an open systems platform.

Q. When will Apple ship its version of PowerOpen?
A. We will ship our PowerOpen implementation in 1994. Further details regarding pricing and availability will be announced at a later time.

Q. How does Apple plan to deliver its version of PowerOpen to market? What channels will Apple use?
A. Apple is investigating a number of different channels.

Q. With PowerOpen, will Apple have two UNIX operating systems offerings?
A. Yes. Apple's UNIX operating systems offerings will be A/UX and Apple's implementation of PowerOpen. *(For more information on A/UX and positioning versus Apple's version of PowerOpen, please see the section on A/UX.)*

Q. How does Apple plan to differentiate its version of PowerOpen?
A. Apple will differentiate its implementation of PowerOpen by adding unique capabilities and features such as multimedia (e.g. QuickTime); electronic messaging and collaborative computing (e.g. OCE); AppleScript; AppleEvents and object-oriented technologies such as those coming from Taligent. Apple will consider third party technologies, as well. Apple will leverage its proven competencies in the areas of innovation, and ease of

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use.

Q. Will all Macintosh computers run Apple's version of PowerOpen?
A. No. Apple's version of PowerOpen OS is an option for those customers who also need Unix-based solutions.

Q. What target segments does Apple believe will purchase PowerOpen?
A. Macintosh customers who require open systems solutions are the target customer for PowerOpen. Apple believes that PowerOpen is the ideal computing environment for customers who want open, next-generation client-server systems. It combines the best productivity applications available with the most powerful open enterprise operating system. Many customers, especially those in enterprise environments demand open, standards-based systems; PowerOpen is for these customers.

Q. Is PowerOpen an end user (client) OS; a server OS; or a development platform?
A. Apple intends to configure PowerOpen for all three environments.

Q. Does Apple plan to promote its PowerOpen offering instead of System 7?
A. No. Apple sees customer requirements for PowerOpen, A/UX and System 7 based on customer preferences and applications.

A/UX

Q. Is Apple abandoning A/UX?
A. Apple is not abandoning A/UX. Apple will continue to ship A/UX to those customers who want it on Macintosh and Quadra systems which are supported by AUX 3.0 today.

Q. Will migrating from A/UX to PowerOpen require recompiling?
A. As with migration to any new microprocessor architecture, recompiling is required. Therefore, existing A/UX applications will need to be recompiled to take maximum advantage of the PowerPC architecture.

Q. How does Apple position A/UX?
A. A/UX is Apple's open systems platform that runs on 68k Macintosh platforms. If customers are satisfied with the performance, functionality, and packaging of A/UX, as well as 68k levels of performance, then A/UX will continue to meet their needs. If A/UX users want to migrate to PowerOpen, Apple will assist in the migration through a number of vehicles including software migration tools, technical consulting and support services, and promotional incentives.

Q. As an A/UX developer, what should I do to take advantage of the market opportunities presented by A/UX?
A. To take advantage of the opportunities afforded by the PowerOpen Environment, A/UX developers should continue building A/UX applications. We intend to provide a migration path for A/UX into the PowerOpen environment.

SOFTMAC/OPENMAC

Q. We've heard rumors that Apple intends to port the Macintosh user interface to other Unix platforms, i.e, Sun, HP. Is that true?
A. Various new business opportunities are under exploration in the open systems market. We have had initial discussions with a number of hardware vendors and ISVs to explore various opportunities, but at this stage those talks are very preliminary and no decisions have been made. Once the business ramifications have been fully explored, Apple will be in a position to announce what these initiatives will be. As always, we will make our decision based on what's good for Apple customers and for Apple.

MACINTOSH OPERATING SYSTEM (SYSTEM 7)
(The following questions-and-answers were provided by MSAD.)

Q. Has Apple licensed the Macintosh operating system to IBM?
A. No. The Macintosh operating system remains Apple's distinct technology. Macintosh Applications Services includes System 7 software. But it is not the complete Macintosh operating system.

Q. Where does the Macintosh operating system fit with Apple's implementation of PowerOpen?
The Macintosh operating system, System 7, is Apple's mainstream offering for all Macintosh customers. In addition to running on today's 68k-based Macintosh computers, System 7 will be the standard operating system shipped on Macintosh computers based on PowerPC microprocessors. Future versions of the System 7 operating system will offer advanced operating system capabilities such as pre-emptive multitasking and memory protection to Macintosh customers. Macintosh applications will run on both system 7 and PowerOpen systems.

(This sentence was edited to provide consistency with an earlier answer.) : PowerOpen is Apple's open systems platform for the PowerPC platform. PowerOpen provides open systems customers with a powerful, easy-to-use, standards-based open systems environment.

Q: What operating systems will be available on Macintosh PowerPC computers?
A: Macintosh computers with the PowerPC microprocessor will host several operating systems. System 7, adapted for the PowerPC microprocessor, will be
the operating system shipped with all Macintosh PowerPC computers. Customers will also be able to run the PowerOpen environment and, when it becomes available, the Taligent operating system. All operating systems will run System 7 applications.

Q: What operating systems will be available for customers wanting advanced
operating system capabilities?
A: Customers who want capabilities like pre-emptive multitasking and memory protection will get those features in future versions of Macintosh's native System 7 operating system. The PowerOpen environment goes further by adding operating services such as full kernel security, client/server operation, etc. appropriate for high-end enterprise server needs.

Q: Is PowerOpen the operating system for PowerPC-based Macintosh computers?

A: No. The System 7 operating system and PowerOpen are both choices for
PowerPC-based Macintosh computers.

Q: Are there future versions of System 7 under development?
A: Absolutely. Apple is aggressively developing the Macintosh System 7
operating system 7 to add important new user & developer capabilities. A
future version of System 7 will include new operating system capabilities
such
as pre-emptive scheduling and memory protection. Other capabilities are
being first developed as standalone modules such as QuickDraw GX,
AppleScript, and A.O.C.E. and will be integrated in future versions of
System 7.

POWERPC
(The following questions-and-answers were provided by MSD.)

Q. Does Apple's move to RISC technology mean that Apple is abandoning the Macintosh?
A. No, Apple has said that the Macintosh is and will remain its primary computing platform well into the next decade. With this in mind, Apple has taken steps to bring the significant power and performance of RISC microprocessors to the Macintosh platform.

Q. Is Apple abandoning the 680x0 architecture?
A. No. Apple has stated that it will continue to improve its Macintosh models based on the 680x0 architecture and broaden its computer offerings to best meet the full range of customer needs.   In the future, the 680x0-based Macintosh will co-exist easily with the PowerPC Macintosh. Apple's customers can be assured they will continue to benefit from the industry's most innovative technology.

Q. Does Apple plan to incorporate the PowerPC 601 into its high-end Macintosh products and use the 68060 to extend its mid-range line?
A. Apple does not release specifics regarding its future product plans. The company has stated, however, that it will offer both 680x0- and PowerPC-based products. We have not made any specific announcements regarding the 68060.

Q. How will the IBM and Apple PowerPC systems differ?
A. Apple is focusing on the personal computer market. AWSD, IBM's workstation division, is the only IBM group at this point which as stated its intent to produce 601-based systems. Product details are confidential, however.

Q. Does Apple plan to promote PowerPC-based Macintoshes over 68K-based Macintoshes?
A. Customers will drive the transition. Some customers will continue to purchase 68k-based systems. Others will seek the performance of the PPC-based Macintoshes.

Q. What Macintosh systems will use the PowerPC chip?
A. The PowerPC chip will power a new generation of Macintosh systems running System 7 in native PowerPC mode--this will include a range of systems from low-end to high-end.

Q. Does Apple plan to incorporate the PowerPC 601 into its high-end Macintosh products and use the 68060 to extend its mid-range line?
A. Apple does not release specifics regarding its future product plans. The company has stated, however, that it will offer both 680x0- and PowerPC-based products. We have not made any specific announcements regarding the 68060.

Q. Will Apple license the Macintosh OS for PowerPC clones, as recent press reports have indicated?
A. Apple has no plans to allow Macintosh PowerPC compatible computers. Nor has Apple changed its position on Macintosh clones. Apple will continue to aggressively defend its intellectual property rights...Apple's protection for its Macintosh computers goes beyond the use of ROMs and copyright protection for the audio/visual display. Apple has a wide range of legal protection for Macintosh computers.

Q. When will Apple ship its first PowerPC (601-based) product?
A. We have stated the first half of 1994, and we're on track to meet that goal.

Q. Why is taking Apple a year from the delivery date of PowerPC chips to
deliver computer products?
A. Last October, IBM and Motorola made first silicon available for sampling, not the final (chips) product. We are extremely pleased with our early sampling and how things are going in our labs. Even after the microprocessor is finished, however, there are many other product development aspects to
complete.

It's important to understand that the first PowerPC based Macs represent a tremendous software challenge as we move a 68000-based software system to a new foundation. That said, we're very pleased with early results in our efforts to make the transition while retaining a high degree of software compatibility. Also, and most importantly, Apple's PowerPC-based products will contain several innovations in addition to the central processor and that work is underway in parallel. This takes time.

(Additional note: by industry standards, one year from delivery date of chips to delivery of computer products is actually very rapid.)

Q. What's the status of the PowerPC development?
(The following answer was provided by the Apple Developer Group and is derived from an article in Apple Direct.)

The Apple PowerPC development team has passed four significant development milestones in the past six months in bringing a PowerPC-based Macintosh to market on schedule in the first half of 1994.

First was the September arrival of the PowerPC 601 chip, the new version of IBM's popular RISC workstation chip that was jointly developed by Motorola, IBM, and Apple. The chip itself was a boost to the development schedule because, for first silicon, it was remarkably solid.

Next using the first chips, the PowerPC team was able to test Macintosh system software running on the new 68020 emulator in late September. The emulation software allows a PowerPC Macintosh to emulate a Motorola 68020 processor and run existing 68000 software. Through emulation, the team was able to run the Finder on the 601 chip and run extensive third-party applications. Even at this early stage, the quality of the emulator was excellent.

The third milestone came in mid-October, when the development team demonstrated a prototype of mixed-mode software running on the 601 chip. Mixed mode allows software to make calls either to the PowerPC instructions or the 68020 emulator. This way, an application can run on the emulator, or be compiled directly to PowerPC and take advantage of the increased performance.

A demonstration of a native Macintosh application running on a PowerPC-based Macintosh was the fourth breakthrough. In early November, the team took a small test application that runs on the 680x0 and recompiled it in MPW to 601 code. Not only did the native version run faster than before, but there were few changes required to move to PowerPC.

With the progress to date, the PowerPC-based Macintosh is on track to catapult Macintosh into the next decade. At the Worldwide Developers Conference in May 1993, you can look forward to finding out more about the next generation of Macintosh and the new opportunities that it will open to you.

THE POWER OPEN ASSOCIATION

Q. What is the PowerOpen Association?
A. The PowerOpen Association is an independent association of system vendors, software developers and users. The founding members are Apple, Bull, IBM, Motorola, Harris, Thomson-CSF, and Tadpole Technologies. All members are dedicated to encouraging the broad acceptance of an open systems standard based on the PowerOpen Environment.

Q. What will the PowerOpen Association do?
A. The POA will promote the PowerOpen Environment, expedite its adoption, and influence future enhancements. The POA provides different levels of participation to accommodate organizations, large and small, as well as those whose interests are immediate or longer term. It will offer testing assistance, market research, customer leads, education, promotion of the environment, on-line bulletin boards, and branding.

Q. Will the POA license the software? How will I get access to it?
A. The Association will not license the software components of the PowerOpen Environment. AIX can be licensed from IBM. Macintosh Application Services can be licensed from either Apple or IBM. In addition, BOS/X can be licensed from Bull, and UNI/XT from Thomson. The Association will license its test suite technology to members and non-members for a fee.

Q. Does the POA control the Macintosh API Specification and the Macintosh Application Engine Specification?
A, No. Because the specifications are based on Apple's Macintosh implementation, the initial version of the specification has been developed by Apple. As the members of the Association determine the need to make changes to the specification has been developed by Apple. As the members of the Association determine the need to make changes to the specification for their systems to meet customer requirements, the specification will be modified with the concurrence of the members.

Q. How much is Apple putting financially in the POA?
A. We have seeded the POA with an initial $750,000. We will contribute $250,000 annually as part of our sponsorship level.

Q. Do any Apple employees work for the POA?
A. No.

Q. Why did it take so long to announce the POA?
A. Actually, the POA has been functioning as an association for several months, working to achieve consensus on a wide range of key technical and marketing issues.

OTHER ISSUES

THE AIM ALLIANCE

Q. What's the status of the AIM alliance?
A. Progress is being made on all fronts of the Apple-IBM-Motorola alliance. Relationship is excellent. We're very pleased.

Q. Has there been friction between Apple and IBM on PowerOpen?
A. In any relationship there are bound to be differences. But we're pleased with the way we've able to resolve those differences and continue making progress.

ECHO LOGIC

Q. How does Echo Logic fit with PowerOpen?
A. Apple used Echo Logic tools to get Macintosh Application Services to the PowerOpen Environment, namely to help create the native implementation of the Macintosh Toolbox and Finder.

Q. Should developers use Echo Logic technology to create native versions of their 68k applications for the PowerOpen environment?
A. Developers should contact Echo Logic to discuss this possibility with them.

Q. Will Apple use Echo Logic tools to rehost any of System 7 capabilities for the PowerOpen Environment?
A. This answer should come from MSAD.

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