Apple and NeXT

Combining unparalleled ease of use with industrial-strength performance
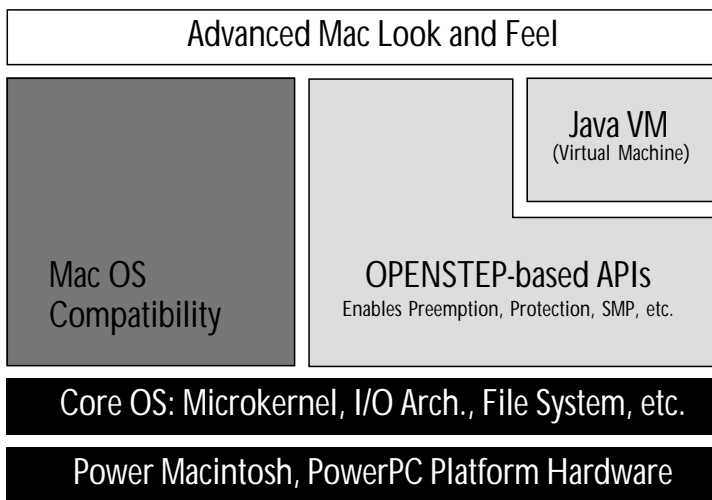
Introduction

Apple has long been known as the premier purveyor of computer products designed to make complex technology simple and accessible—the creator of "the computer for the rest of us": the Macintosh. It is precisely because of Apple's ongoing commitment to providing the most usable—and hence most useful—computer technology that we recently made what might seem a radical move. We have announced our plan to acquire NeXT Software, Inc., a company that has built an outstanding reputation in the industry for high-performance computing and ease of development.

Why NeXT?

When Apple began to define the characteristics of a system software architecture that could take us into the future, we had very clear goals. It's widely accepted that the Mac OS excels in the areas of ease of use and multimedia. So we knew that any technology strategy would have to complement those strengths. In addition, because of our vision of the future—which we believe will increasingly involve Internet technology—we were particularly concerned with giving our customers a computing environment that not only improved on our traditional areas of strength, but also delivered industrial-strength performance and stability for computing into the 21st century. And considering what our customers were doing—and what they wanted to be able to do—after extensive examination of several options, we chose NeXT technology. Not only does NeXT offer complementary strengths in the areas of performance, stability, network management, and rapid application development, it also shares a significant bond with Apple: Both companies were, in large part, the inspiration of Steve Jobs—the well-known industry visionary whose lifetime aim has been to create "insanely great" technology.

Rhapsody Architecture

Advanced Mac Look and Feel

Mac OS Compatibility	OPENSTEP-based APIs Enables Preemption, Protection, SMP, etc. Java VM (Virtual Machine)

Core OS: Microkernel, I/O Arch., File System, etc.

Power Macintosh, PowerPC Platform Hardware

Code-named Rhapsody, the operating system based on Apple and NeXT technology aims to provide unparalleled ease of use with industrial-strength performance. A key part of the Rhapsody architecture is a PowerPC-native compatibility environment for the Mac OS, designed to ensure that both existing Mac OS applications and current Macintosh peripherals can work without modification.

Why Rhapsody?

Rhapsody is the code name of the first system software effort planned from the prospective union of Apple and NeXT. Its intent is to extend the existing strengths of both companies to provide a computing environment that is both stronger and more flexible—and, ultimately, better able to meet the needs of our customers—than currently available offerings. More specifically, Rhapsody targets the following goals:

• *High performance and stability*—Rhapsody will be an "industrial-strength" operating system (OS)—a stable, modern, fully preempted and memory-protected multitasking environment, with built-in capabilities for symmetric multiprocessing.

• *Superior Internet/intranet support*—Already, the Mac OS offers leading advantages in all three major Internet usage areas: access, creation, and delivery. These advantages, when

backed by NeXT's extensively tested and deployed network-optimized technology—as well as full, built-in support for Java—should make Rhapsody an unparalleled Internet/intranet environment.

• *State-of-the-art multimedia*—Apple's existing multimedia technologies, known collectively as the QuickTime Multimedia Layer (QTML), have already become de facto industry standards for multimedia creation and playback—especially on the Internet. Apple plans to optimize QTML for Rhapsody, allowing this system software environment to share in and extend Apple's tradition of multimedia leadership.

• *Ease of use*—Rhapsody will build on the ease-of-use tradition long established by the Mac OS. It will preserve the familiar "look and feel" of today's Mac OS user interface, while incorporating improvements from both Apple Labs and NeXT technologies—providing features that complement Rhapsody's superior power by making the user experience even simpler and more engaging.

• *Rapid application development and prototyping*— The object-oriented NeXT environment is already renowned for streamlining application development— a capability that is becoming increasingly important as more organizations turn to Internet technology to handle their communication and information management needs.

• *Compatibility*—A key part of the Rhapsody architecture is a PowerPC-native compatibility environment for the Mac OS, designed to ensure that both existing Mac OS applications and current Macintosh peripherals can work without modification (see architecture diagram and next section for more details).

Smooth Transition to Preserve Customers' Investment
Over the years, Apple has carefully considered the impact of technology shifts on our customers—both on their day-to-day operations and on their bottom line. As a result, and in contrast with alternatives, our operating system advances are designed to enhance customer capabilities without rendering earlier technologies and products obsolete. In defining the Rhapsody specifications and architecture, we thoroughly evaluated a variety of alternatives, arriving at a development strategy that allows us to provide a smooth transition to next-generation computing, while preserving customer investments in Mac OS–compatible hardware and software.

Looking Ahead
The acquisition of NeXT marks a major difference in Apple's system software strategy—but that difference represents an addition rather than a redirection. Specifically, our approach will enable us to deliver compatibility with current computers and applications (to protect customer investments), accelerate the delivery of innovative software, and, above all, provide a smooth transition to a next-generation operating system designed to meet future computing demands.

Under this approach, we will continue to enhance the classic Mac OS in line with our recently announced strategy of developing and distributing semiannual system software upgrades. This regular schedule of innovation will enable the Mac OS to continue to serve the needs of current customers who want the easiest-to-use computing environment for their existing Mac OS–based applications and files.

Augmenting our Mac OS product line, at the outset we expect that Rhapsody will especially appeal to customers who require the highest system performance and throughput, in fields such as print publishing, Internet content development and publication, in-house application development, and video editing. However, because Rhapsody is based on coupling Apple's exceptional ease of use with superior performance and stability, we expect that the new operating system will ultimately meet the needs of all customers.
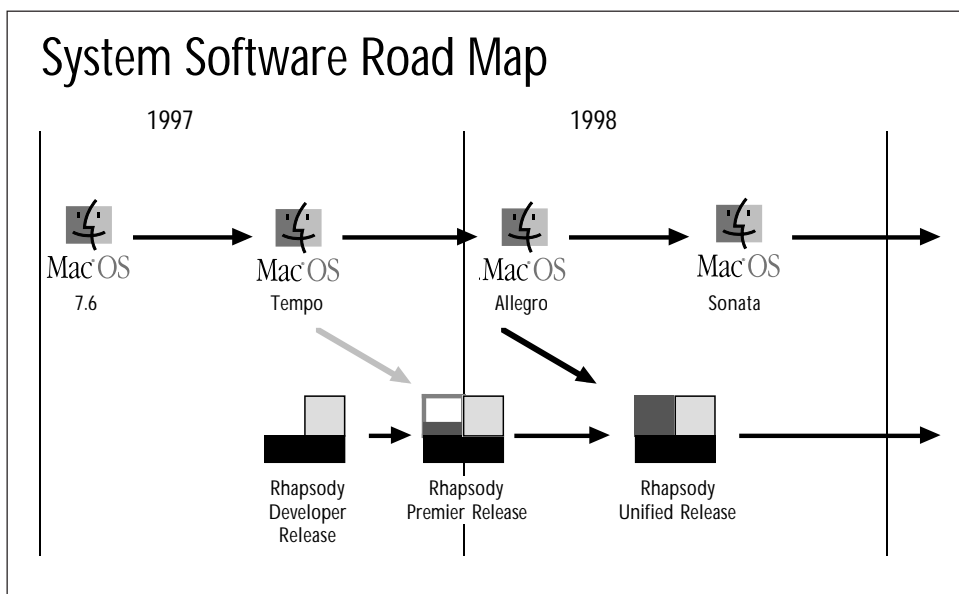
As the road map diagram illustrates (see next page), our intent is to offer an initial developer release of Rhapsody during 1997. This will allow third parties to begin developing the next generation of applications for PowerPC processor–based systems in a timely manner. Our goal is to ensure that when Rhapsody is ready for general customer release (slated for mid-1998), users will be able to choose from among numerous software solutions that allow them to take advantage of the greatly increased stability and performance this environment offers.

It is important to note that our road map calls for a premier release of Rhapsody before we have integrated the capabilities designed to provide full backward compatibility for existing Mac OS–based applications (see the architecture diagram). Intended for the earliest evaluators and adopters of new technology, the premier release of Rhapsody is a key part of introducing the new

OS foundation and application programming interfaces (APIs) to developers, technology managers, and other customers. It will also offer Apple customers a choice: They can move to Rhapsody to employ the "latest and greatest" OS with its extraordinary performance for specific solutions, or continue to enjoy the regularly improving implementations of the traditional Mac OS.

What does Apple intend to do with NeXT technology?
Our aim is to integrate the best elements of the current NeXT system software technology with the Mac OS to create a truly modern, high-performance operating system that can meet the demands of both individuals and organizations for enhanced computing capabilities.

System Software Road Map

1997   1998

Mac OS 7.6 → Mac OS Tempo → Mac OS Allegro → Mac OS Sonata →

Rhapsody Developer Release → Rhapsody Premier Release → Rhapsody Unified Release →

Apple's two complementary operating systems—Mac OS and Rhapsody—will allow the efficient development and delivery of innovative computing technologies. This development strategy is designed to provide a smooth transition to next-generation computing, while preserving customer investments in Mac OS-compatible hardware and software.

Does this mean that Apple is abandoning the Mac OS?
No. Our plans call for continued support of—and enhancements to—the existing Mac OS through semiannual releases (see road map diagram). Thus, concurrent with our development plans for Rhapsody, we will continue to integrate the latest Apple technologies into the Mac OS, delivering updates every six months.

What about the Mac OS "look and feel"?
Apple understands the value of a consistent user interface across operating systems—in terms of both ease of use and training and support efficiency. So Apple's plan is that Rhapsody's user interface will continue the tradition of unparalleled ease of use established by the Mac OS, while incorporating elements of NeXT user interface technology that can augment the familiar, intuitive Macintosh interface.

Q&A

Why did Apple decide to purchase NeXT?
Apple's recent agreement to acquire NeXT was the culmination of an extensive examination of available system software technologies. Our goal was to find the technology that could best complement the existing strengths of the Mac OS, while helping to ensure that its cutting-edge status could be maintained in the computing world of the future. After considerable research, NeXT became the obvious choice, based on its outstanding reputation in the industry for an environment that offers high performance (preemptive multitasking, protected memory, multithreading, and more), stability, networking and Internet optimization, and fully mature object-oriented development capabilities for rapid application development and prototyping.

Which Macintosh models will Rhapsody support?
Initially, Rhapsody should support all currently shipping PowerPC processor–based Macintosh systems, from Performa computers through PowerBook and Power Macintosh models.

What about existing applications—will they run on Rhapsody? What about existing peripherals?
Apple is committed to enabling Rhapsody to run existing applications written for the current Mac OS, delivering performance that meets or exceeds current performance levels. This support will be achieved by hosting a native version of the Mac OS on a modern microkernel, enabling the Mac OS to run under Rhapsody in native mode, as opposed to emulation—thus providing outstanding speed and responsiveness. In addition, most existing networking setups, printers, monitors, and cards will be supported.

What competitive advantages does Rhapsody offer?
We expect that customers who value the strengths of Apple's current offerings will find that the performance and feature set of Rhapsody either meet or exceed those of alternative operating systems. In particular, its high speed, outstanding performance and responsiveness, and unparalleled ease of use should make Rhapsody the preeminent platform for publishing and other media-related functions, for the full range of Internet applications, and, ultimately, for everything that our customers have always looked to the Macintosh to help them do.