hat's In a Version Number? For Mac Users, Plenty

As fiscal years roll by and trade shows come and go, we must at

times reflect upon that age-old question, "What's in a version number?" Originally devised to differentiate software programs and packages which were constantly being revised, these days the version number has become something of a marketing tool. Whereas in days of yore every single .01 meant something (as it does today, back in the code workshop), nowadays certain commercial software publishers use inflated, artificial version numbers to give the impression of significant new functionality and performance, when in fact none exists.

Luckily for Mac users, Apple Computer is not one of those companies. For years, Mac users have been treated to steady incremental updates, honest bug fixes (not marketed as "Upgrades" or "Service Packs"), and regular major overhauls of our beloved System, each time making the Mac OS the most advanced and easy-to-use operating system available for consumer use.

As I write this, the Mac world steams towards OS X — the technologically advanced, highly versatile and customizable, powerfully usable and stable operating system of the future. Incorporating the iron guts of a best-of-breed version of the powerful and time-honored UNIX operating system, system abstraction technology from NeXT, and the legendary Macintosh user interface, OS X will put Win9x to bed with DOS, and should even give Windows NT/"2000" a run for its money in terms of features, performance, reliability, and usability.

It's a Long Way to Eden...

However, accomplishing this is no easy task. Though Mac users

can

look forward to a familiar look and feel to the new hot-rod engine,

under their hood, the new OS works with a substantially re-engineered core. Whereas a simple incremental System update typically requires only minor modifications in software written for it, the new OS X environment requires that developers change the basic ways in which they write software to work on the Macintosh platform. So far this has been a reportedly smooth transition — perhaps even smoother than the difficult but well-handled migration of 680x0-native software to PowerPC — but nevertheless, it is a significant change in the Mac's functional landscape, and cannot be accomplished overnight.

Fortunately, Apple is making the transition as easy as possible for both users and developers. Apple is skillfully modifying the user environment and programming interfaces in ways which progress steadily towards OS X, while maintaining the backwards-compatibility and familiar usability which provide a consistent and continuously viable platform. As I write this article, Apple engineers are hard at work preparing the first round in this step-by-step migration towards the future of the Mac OS. Code named Sonata, this forthcoming release is currently referred to as Mac OS 9.0, although according to Mac OS Rumors, at http://www.macosrumors.com/ , Apple executives are fearful of lawsuits from a little-known company that owns the trademark name "OS9." Nevertheless, we shall not trifle over these sorts of petty details; instead, we will stampede directly towards — yep, you guessed it, the Features! Why? Because they're in there, and because we can. When I'm done, Windows users can fill me in on what they were going to say after, "Win 98 is three whole years more advanced than Win 95..."

4-Bit Date/Time Support: Fixes the Year 2039 Bug!

Wow, features. Where to begin? There are certainly more new

features than I could talk about in this short article, and many will

interest some Mac users more than others. With that in mind, I'll stick to the stuff I think is the coolest and, more importantly, and I'll try to make it clear how the new functionality will affect users and developers. First, I'll focus on changes in the user environment and in the basic capabilities of the operating system. Then, I'll talk briefly about what's new for software developers, including how Sonata converges technically with OS X and Carbon.

Users

Among the most prominent of the new features will be an improved version of Apple's multi-purpose search utility, Sherlock. The new Sherlock 3.0 will sport a new interface design, giving users a single window in which to manipulate search criteria and view the prioritized results. Additionally, users may now perform a keyboard shortcut to launch an Internet search directly from the Finder without first launching Sherlock and clicking on the "Search Internet" tab. Plug-ins will be categorized by topic into sets, making for easier search-engine management. Support for LDAP directory services will allow users to search for people over the Internet. Finally, Sherlock 3.0 will feature fast, intelligent searching of many e-commerce sites, displaying organized product and pricing information. All told, this is not your father's "Find File" utility — soon, Jobs willing, Sherlock will be the single best way to search for anything on the Internet!

Another tasty treat making its debut in Sonata's commercial release will be a new tool for the automatic updating of system software. Apple Software Update 1.0 will, with permission, scan users' hard disks for Apple software (thankfully keeping its nose out of everything else), check it against the packages available on Apple's servers, download needed software updates, and automatically install them for the user. This utility will be customizable

according to user preferences, with optional warning dialogs for approval of downloads and installations, and can be set to automatically run and check for updates according to a user-defined schedule — just like that.

In addition to these handy utilities, Sonata will also ship with updated troubleshooting and technical support capabilities. A new and improved version of the AppleGuide will be included, and an updated Help Viewer will allow users to quickly and easily search for and download HTML-based help files — such as FAQs, ReadMe files, and troubleshooting information — from Apple and third-party software publishers and hardware manufacturers.

And That's Not All, Jim!
Graphics and print professionals have treats in store for them as
well. Software tools packaged with Sonata will enable them to manage their files more easily and efficiently. A major update to Apple's ColorSync color calibration technology — already preeminent in digital publishing, and moving into Windows territory — will allow everyone from prepress production specialists to printers and web publishers to ensure no-hassle, consistent color reproduction. ColorSync 3.0 will feature improved automation via command scripting, and will be equipped to manage color profiles for documents, displays, and printing hardware throughout all stages of production. Additionally, a new technology called FontSync will allow publishers to manage, identify, and match the sets of fonts they work with, ensuring accurate reproduction of type in documents which must change hands frequently. Sounds like those inroads Windows NT has been making in the graphics and desktop publishing industries just collapsed...

Sonata will also sport a couple of new features which should eliminate System bottlenecks and improve performance. My personal favorite are the new Alert dialog boxes. In the past, dialog boxes would demand immediate attention from the user, halting all other processes and refusing to release control of the System until the user answered them. Starting with Sonata, dialog boxes and other alerts will appear in those little "floating windows," allowing the user to continue working until darn tootin' ready to answer them, and allowing other applications to continue getting their share of system resources without waiting for the dialog to go away. Another of my favorite features will allow resource-intensive applications, such as 3D modeling programs and games, to minimize the Finder's activity when they are active, allowing maximum resources to be devoted to the task at hand.

It's easy to see that the next version of the Mac OS will offer several helpful improvements to the basic user experience — but if that were all there is in store for us, this would be a concluding paragraph — and there's a whole

'nother section below! What gives!? Well, it turns out that Sonata will boast some fantastic new networking features, including some that will be of interest to — gasp — system administrators! This next section will examine some of these new goodies.

he Hard Stuff

This section isn't called "The Hard Stuff" just because I like to have
a heading with that name in all my articles. Rather, I chose the
name because the features I'll talk about here are a bit more advanced than the ones I've already discussed. Also, I like to have a heading with that name in all my articles. Ha, ha — fooled you!

But seriously, folks, my jokes suck, so I'll be forced to stay on topic, even though I'm sure Mr. Editor-in-Chief Barzeski and all our readers secretly love these jaunty little departures. In pursuit of our original aim, let's take a look at Sonata's forthcoming networking features.

One of the most powerful new features coming our way is the new file-sharing system. In addition to various bug fixes and stability improvements, the File Sharing control panel has been expanded to deal with user profiles, which were previously handled by a separate module known as Users & Groups. As if that weren't enough, Mac users are no longer chained to the AppleTalk protocol for their file-sharing needs: network users may now exchange files with other Macs and use program linking over the Internet — as well as over any local network — via standard TCP/IP communications protocols! Imagine mounting an AppleShare server in China and downloading files, or even running programs on your home computer remotely via another Mac! And while you're at it, tell your PC friends where they can stuff their Network Neighborhood...

Safety First!
Another jaw-dropping feature of the forthcoming Sonata is a
brand-new security technology based on a system known as Fast
Elliptic Encryption (FEE). FEE scrambles data through the application of complex mathematical functions for which decades of research has failed to find efficient solutions. The sheer difficulty of solving these problems makes it impossible to decipher without massive hardware and software — a white paper put out by a security corporation named

Certicom, found at http://www.certicom.com/ , talks of government efforts to break elliptic encryption codes using a machine containing 325,000 processors and costing over $10 million! The particular difficulty of solving the elliptic curve equations used in FEE allows extremely high levels of security with relatively low key sizes, resulting in easier, faster operation and lower memory requirements.

Taking full advantage of this advanced security technology, Sonata will feature a powerful drag-and-drop application called Apple Secure Compression, which will simultaneously encrypt and compress files with a flick of the mouse, all at blazing speeds. According to Apple Insider, located at http://www.appleinsider.com/ , "Encryption and decryption of reasonably sized files is instantaneous." Additionally, Sonata's new encryption technology will allow users to safely store records of passwords. The Keychain, as it is called, includes support for technology which allows for secure transactions over the Internet. Other built-in functions will allow for file authentication, digitally signed messages and files, and automated logins to various services.

Were that the end of Sonata's new networking features, we'd already have plenty to be impressed with — but it's not! Take a walk with me over to the wild side, so to speak, and let's see what happens when it comes time to set up a whole network based on the latest Mac OS.

The Mac OS Heads the Multi-User Way
                Back in the olden days of computing, hardware resources such as
                 processing power, memory, and storage were limited and expensive.
                What few computers existed were large, unwieldy mainframes available only to wealthy corporations and government-funded research products. Scientists and analysts hoping to use them had to share, scheduling "computing time" whenever it was available, which was typically not very often. In an effort to solve this frustrating problem, a concept called "timesharing" was invented, under which a computer's resources were divided equitably among multiple users working simultaneously. Needless to say, a fundamentally different approach to building computer operating systems was required to make this concept a reality. Today, the world's oldest and most powerful operating system, UNIX, is the preeminent example of timeshared computing.

I've included this little bit of technological history in order to make an important distinction between true multi-user operating systems, such as UNIX and Mac OS X Server, and operating systems which allow multiple users but do not support timesharing, such as the forthcoming Sonata and

its ugly cousin, Windows NT. Sonata will allow multiple users to have login access to shared network machines, but like NT, will only allow a single user to work on the computer at a given time. With this functionality, machines running Sonata will not be as capable as full-featured UNIX or OS X servers, but they will make ideal workstations and lab computers for networked environments.

What Do You Mean, Ideal?

I mean ideal. Looking beyond the tired old login/password challenge which has traditionally locked out unauthorized access to shared machines, Sonata will boast an impressive and incredibly cool new function: voice authentication. Users will be able to simply speak a passphrase instead of going through the usual clunky login process (though the old standby will always be available in case of flu or inexplicable post-concert voice loss). Users will surely have the standard skeptical feelings about speaking their password out loud, but they can rest assured that it's incredibly difficult to reproduce the voiceprint with a recorded playback. It's virtually impossible to mimic anyone's voiceprint closely enough to fool the computer because the computer can hear things your ears can't, and compare sound samples with mathematical precision your brain never bothers with. Aside from circumstantial changes like sickness, your normal speaking voice always sounds essentially the same.

Network administrators will have detailed control over usage privileges over a Sonata network. Administrators regulate access to shared volumes, printers, and other Chooser items, CD-ROMs, Zip disks, and other storage media, as well as the System folder, shared documents, and other sensitive

stuff. Additionally, Sonata will keep track of user preferences for System behavior, Internet use, and application settings, in addition to preserving each user's individual desktop. Furthermore, administrators will have various tools for monitoring system usage, allow guest access safely with customized access, and password-lock logged-in machines while users are temporarily away. Finally, the new Network Assistant 4.0 will provide customizable automation of maintenance tasks such as scanning, repairing, and rebuilding hard disks, producing reports on hardware and software resources, and even rebuilding the desktop(s). All told, the new Mac OS will make it easier than ever to set up and operate small or large networks — as well as use them effectively!

hat More Could There Be? Look Under the Hood!

Simply put, this forthcoming version of the Mac OS will bridge the

gap between the current Mac OS 8.x legacy and OS X. Though the

fundamental operating system underlying all the outward appearance is based on the current legacy, the basic elements of the user interface, functionality, and programming interface approach what will be available with OS X.

The biggest obstacle is almost cleared: the software migration to OS X is coming along smoothly. New extensions to the legacy system architecture provide full Carbon compatibility, allowing updated and Carbon-native apps to run as-is under Sonata, though without the advanced functionality of OS X. Meanwhile, the APIs — the interfaces which allow software developers to write software which works with the operating system and work like the operating system — are settling into the roles they'll soon be playing when running under OS X.

Of course, if you're a Mac developer, you probably know all of this already — in fact, you probably even have the beta version! For the rest of our readers, I'll try to provide a user's-eye view of what's going on down in the trenches.

In keeping with its trend towards the adoption of industry standards wherever practical, Apple will update the industry-standard OpenGL graphics platform, providing stronger support for this technology which allows game developers to build Mac games with the same graphics implementations they're used to working with, instead of re-engineering code written for one environment to work in another. Additionally, a number

of new Sprockets libraries provide developers with better network interfaces, high-quality 3D sound imaging, and universal USB support, including — get ready — system-level support for multiple-button mice and even scroll wheels!

Give Me More!
The latest Mac OS will sport expansion of some basic system features, including support for longer file names, larger file sizes, and a higher limit on the maximum number of open files. Sonata's built-in text-editing capabilities allow for larger file sizes, finally dispensing with SimpleText's 32K limit. Sonata also includes support for Unicode, a standardized typeset which handles different alphabets and special characters better than the current ASCII standard (which was primarily designed for the Latin alphabet used with English and other Indo-European languages). And, in a move which will no doubt please international users, the Mac's multiple-language capabilities, formerly packaged in separate software products, will now be built into the basic System.

Furthermore, proceeding along with Apple's efforts to standardize the appearance and functionality of the Mac OS, Sonata includes new libraries which will enable developers to take advantage of the Finder's data display conventions, allowing them to build standard functionality, such as list views and sortable displays, directly into their applications without having to write them from scratch. Additionally, Sonata's APIs will allow developers to build their applications using customizable implementations of the Finder's basic capabilities for file navigation and filtering, network browsing, and the creation and display of file previews.

On top of all the cool stuff I've mentioned here, Sonata will sport a number of other minor improvements. Among these updates will be a new and improved Open Transport, revamped PlainTalk and Speech capabilities, more stable AppleScript behavior, and the consolidation of many extension-based functions into the System. All told, the latest Mac OS sports a polished shine on every corner!

hew!

Have you had enough? I have — it already looks like I'll still be figuring out all of OS 9.0's features when OS X rolls around! But

come to think of it, I'm sure all you readers out there have no use for a supercharged, feature-packed update to their already-stellar Mac… or do you? Decide as you will, but in any case, you'll have until Sonata's anticipated late-October shipping date to mull it over in your head — and also to save up $99, just in case you succumb to an impulsive moment once that magic day arrives. But bear this in mind: if you don't snap up this excellent upgrade, you'll just be bitter until OS X rolls around…

Until next time… well, let's be honest, I'll probably be futzing around on the 'Net… ;-)

URLs From this Article:

http://www.macosrumors.com/

http://www.certicom.com/

http://www.appleinsider.com/

Morgan Williams

morgan@applewizards.net