

ACSE Update 1999 Mac OS X Server



Notes

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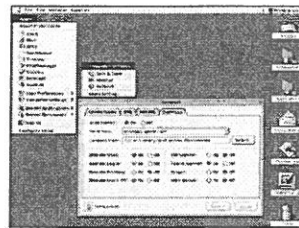
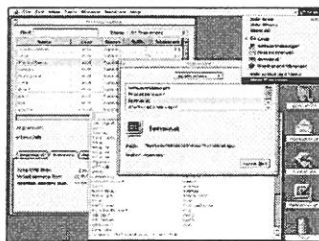
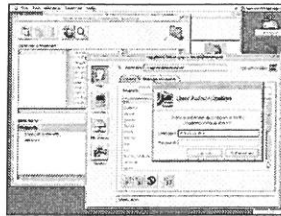
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Key Features

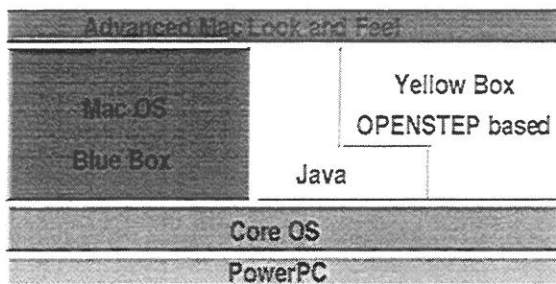


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Notes

Robust Core Operating System

- Kernel based on Mach 2.5 and BSD 4.4
- Protected memory
- Preemptive multitasking
- Native support for 100% Pure Java (JDK 1.1.6)



Notes

Mach Kernel

Mac OS X Server is based on the battle-tested, rock-solid Mach microkernel, giving you the benefit of uncompromising Unix-style process management. Protected memory puts each service in its own well-guarded chunk of dynamically allocated memory, preventing a single process from getting out of hand and bringing down the system or other services. Preemptive multitasking ensures that each process gets the amount of CPU time and system resources it needs for optimum efficiency and responsiveness. You can easily stop and restart any service at any time without affecting the rest of the server.

Protected memory

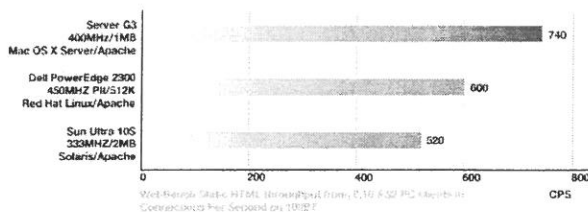
Virtual Addressing Protected-Mode segments are divided into Code and Data segments. Unlike addressing in real mode, the processor considers the memory as virtual, which means that the final physical memory address is unknown to the program. Because of this, physical memory is never addressed directly. This procedure forms the basis for the use of a virtual memory administration. The Operating System can place code or data areas on the hard disc if it needs to do so.

Preemptive processing

In a multitasking operating system, multiple tasks (threads) are generally controlled by a scheduler that preempts or interrupts each process, granting processor time in the form of a time slice. This enables multiple tasks to apparently run at the same time. However, each task runs for a time slice and is then preempted by the next process, which in turn is preempted—rotating processor time among active threads. In preemptive multitasking, the operating system is empowered to override (or preempt) an application that is using too much CPU time, as opposed to cooperative multitasking where the applications themselves are responsible for relinquishing the CPU on a regular basis.

Industry-leading web server

- Standard implementation of Apache 1.3.4
- Optimized for fastest Apache performance
- Fully integrated single-button setup



Notes

Apache 1.3.4 web server

Mac OS X Server includes a fully native port of the open-source Apache 1.3.4 web server, the #1 HTTP server on the World Wide Web.

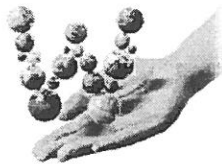
Unrivalled in terms of sheer functionality, speed and reliability, the Apache web server software runs everything from the web site of the World Wide Web Consortium to the web site of the British monarchy.

In a 1998 cover story on the phenomenon known as open-source software, *Forbes* magazine called the Apache server “a technical marvel that commands more than 50% of the booming market for Web server software.” In web time, August 1998 was eons ago. Since then, the Apache server’s market share has continued to skyrocket: The Netcraft Web Server Survey (February 1999) tabulated responses from 4,301,512 web sites, and found that 2,350,748—an astonishing 55%—were using Apache Servers.

Last year, Apache not only won the hearts and minds of webmasters, the Internet's most popular web server swept the awards, too—including Network Magazine 1998 Product of the Year, C|Net Award for Internet Excellence, ServerWatch 1998 Hall of Fame, and NewMedia Magazine 1998 Hyper Award. And now Apache is a core component of Mac OS X Server.

Powerful application server

- 50-transactions-per-minute license
- Full suite of WebObjects development tools



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WebObjects

Transaction management, dynamic data access and content-generation capabilities—plus fabled ease of use—are some of the strengths that make Apple's WebObjects the #1 application server on the market. WebObjects earned this reputation when running on Unix and NT systems; now watch what happens as it runs on the Macintosh.

WebObjects (Apple's cutting-edge technology for building flexible, scalable network applications) handles all your application server requirements—including load balancing, state management, HTML generation, and Java client interoperability.

Adobe Systems, Inc. uses WebObjects for online product registration. Aetna US Healthcare used WebObjects to build the first interactive web enrollment application for a nationally managed care provider. BellSouth uses it to provide its customers with up-to-date phone bill and payment information, while the Standard & Poor's full-featured financial web site offers WebObjects-based planning tools, investment plans and customized information services.

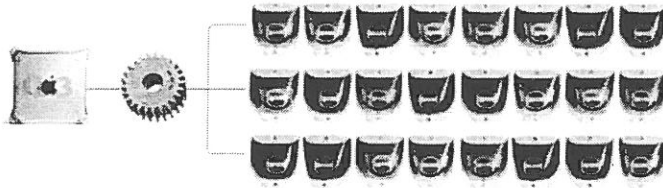
WebObjects Builder

WebObjects 4 offers great functionality for power users: WebObjects Builder gives you drag-and-drop control over HTML layout, Interface Builder provides control over Java applets, and Project Builder lets you build Java, ANSI C, C++ and Objective-C projects.

With support for simplified construction of user interfaces and direct connections to existing applications and data resources, WebObjects 4 makes it a snap to create new network applications that deliver industrial-strength performance. And with features such as Direct to Web code-free development, creating great new solutions has never been easier. (Just wait till you see what Macintosh developers do with that capability.)

Macintosh Workgroup Management

- NetBoot technology
- NetBoot Desktop Admin software



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NetBoot

With NetBoot, Mac users enjoy an authentic Macintosh experience. NetBoot keeps track of individual users and their preferences. Students, for instance, can access their personal desktop from anywhere on the network. No matter which Mac they use to log on, they get the same personal desktop. For an individual user, it's like having your Mac follow you around.

Benefits for IT Professionals

For IT managers, NetBoot makes managing a network as simple as managing a single Macintosh. The best part is, all iMacs (and now all G3s) leave the factory NetBoot-ready—and so do all Macintosh applications. Tested in the computer labs at Dartmouth College, the University of Michigan, and the Hacienda La Puente Unified School District in Southern California, NetBoot has a number of benefits for IT professionals.

NetBoot computers don't require local configuration, so setting up a network of iMacs is a snap. NetBoot also allows networked iMacs to run the same system software and applications stored on the NetBoot server; updating the server once automatically updates all the iMacs on your network.

Instead of installing a new application on every iMac on your network, you just install the application once on the server, and—boom, every iMac on your network has got it. And adding new iMacs is simple. Just plug in the Ethernet cables and the iMacs are ready to go; NetBoot configures them automatically.

You control the System Folder

NetBoot server gives you powerful tools to control and protect your network. These include Macintosh Manager, the server administration tool that lets you set system policies for controlling user access to applications, AppleShare volumes and printers—in effect, to define the parameters of the user experience. As an IT manager, you'll find that NetBoot turns your job from constantly putting out fires to actually managing a network.

Scalable file services

- Comparable to AppleShare IP
- > 4,000 open files per process
- > 1,000 simultaneous connections
- Distributed network database



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Apple File Services

Mac OS X Server simplifies the process of sharing files and allocating network resources with Apple File Services (AFS). AFS comes with a server administration tool that's as friendly as the Macintosh; basic setup takes just minutes with an easy-to-use interface.

Setup isn't the only thing that's fast about this new software. Performance tests conducted by Apple show that when large files and folders are copied over 100Mbps Ethernet, a 300MHz Macintosh Server G3 running Mac OS X Server with Apple File Services easily beats a 400MHz Pentium II server with Windows NT 4.0.

Apple File Protocol

Besides extremely fast file transfers, Mac OS X Server includes a native implementation of the Apple File Protocol (AFP), allowing it to share HFS+ volumes with any AppleShare client over TCP/IP or AppleTalk. This allows authorized users to collaborate via an AppleTalk network, your intranet, or the Internet.

Perhaps best of all, Apple File Services share the same administrative console. So wherever you happen to be, you can exercise complete control over your workgroup's network environment—remotely—from any web browser.

Support Items

- File system performance
- QuickTime technology on MacOS X
- NetMeeting
- Directory structure
- File and path names

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File System Performance

- Partition size is important for I/O performance
 - Mac OS Standard format
 - Multiples of 256 MB (or max. 32 MB less)
 - MacOS Extended
 - Minimum partition of 2 GB
- Mac OS Extended format is preferred
 - Support for permissions
 - Support for BSD file types
 - Support for AppleShare

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File system performance

File system performance on any Mac OS format disks (Standard or Extended) using Mac OS X Server will be dramatically affected by the allocation block size on a given disk or partition. The system is designed to accelerate input and output (I/O) to files only on volumes whose allocation block sizes are an even multiple of 4K; I/O to files on volumes with smaller or larger allocation blocks will be slower.

Optimal Mac OS Standard format volume size

- 224 - 256 MB
- 480 - 512 MB
- 736 - 768 MB
- 992 - 1,024 MB
- 1,248 - 1,280 MB
- 1,504 - 1,536 MB
- 1,760 - 1,792 MB
- 2,016 - 2,048 MB

For the best performance on a Mac OS Standard format disk, you should partition the disk with these size ranges.

Allocation block sizes on Mac OS Extended format

Allocation block sizes on Mac OS Extended format volumes are determined with a different algorithm, and the allocation block size on these volumes will never be larger than 4 KB. Volumes under 2 GB will be created with increasingly larger allocation block sizes up to 4 KB and any volume or partition of 2 GB or larger will be created with an allocation block size of 4 KB. Mac OS Extended disks or partitions should therefore be at least 2 GB in size for optimal performance.

Differences between Mac OS Standard and Mac OS Extended formats

In addition to the usual advantages of the Mac OS Extended format, there are several features in the Mac OS X Extended format that are specific to Mac OS X Server operation. Because of these differences in features, you should always format Mac OS disks for Mac OS X Server with the Mac OS Extended format rather than Mac OS Standard format.

Support for file and directory based permissions.

Mac OS X server supports file and directory permissions in the same way as BSD systems. The Mac OS Standard format cannot store this information. All files and directories on Mac OS Standard format volumes have a universal permission set to allow read access to all users and both read and write access to root users and the Blue Box and this cannot be changed.

Attempts to change the owner, group, or permissions of a file on a Mac OS Standard format volume will not change these values, but this failure will not lead to an error message. Mac OS Extended format volumes can store permission and other security information about files. If permissions have never been set for a file or directory on a Mac OS Extended format volume, the universal permission set is used. Users may, however, change the permissions of a file or directory on a Mac OS Extended format volume; these user set values will then be stored and used.

Support for BSD file types.

The Mac OS Standard format cannot store BSD file type information. This is especially noticeable with symbolic link files that are not supported on Mac OS Standard format volumes. The Mac OS Extended format can store this information, so link files are supported.

Support for AppleShare.

You cannot share Mac OS Standard format volumes using Apple file services on Mac OS X Server, unless those volumes are on CD-ROM media.

QuickTime Technology on MacOS X

- Based on QuickTime 3.0
- Third-party CODECs not supported
- No audio and video capturing
- Files need to be 'world-readable'
- QTVR, QT3D, and MPEG not supported

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QuickTimePlayer

The QuickTimePlayer application is a demonstration of QuickTime technology on MacOS X Server. It offers the following features:

- It is based on QuickTime 3.0.
- Media files can be opened and played.
- The player enables simple editing features.

Known Problems

- QuickTime 3.0 third-party codecs are not supported in this release. This includes Sorensen Video, Indeo, Qualcomm PureVoice, and QDesign Music codec.
- Audio and video capture are currently not supported.
- There is no developer access to the QTML framework yet. This will be rectified in the Carbon release.
- Movies playing offscreen may display incorrectly when brought back onscreen. Use the Window Shade button to hide and show the window to redraw its contents.
- Files need to be world-readable to be viewed.
- Files at root (/) level cannot be read. Try moving them into a directory.
- The movie thumb controller sometimes leaves portions of itself behind.
- When the QuickTimePlayer application crashes, the cursor sometimes remains hidden.
- Shift-click and drag in the movie controller doesn't work (use shift-click instead).
- QTVR, QD3D, and MPEG are not currently supported.
- Playing movies backwards may sometimes fail.
- PC graphics cards set to 4444 16-bit pixel format will not provide correct visual results.
- Dual monitor setups are not supported.

NetBoot

- Support for iMacs and new Power Macintosh G3
- Clients run Mac OS 8.5.1 with a few minor modifications
- No special provisions for software licensing
- No access to internal hard disk (via extension)
- Minimum configuration for a server:
 - Macintosh G3 computer
 - 5GB hard disk
 - 64MB of RAM

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Notes

Supported Macintosh computers

All iMac computers and the new Power Macintosh G3 (Blue and White) computers introduced at Macworld 1999 have the necessary hardware and firmware to support NetBoot. Future Macintosh computers may also be NetBoot-capable.

Systems that are not NetBoot-capable can only take advantage of the file, Web, and Macintosh Management services of Mac OS X Server.

Version of the Mac OS

NetBoot clients run Mac OS 8.5.1 with a few minor modifications. These modifications allow the Macintosh to operate over the network and do not affect the user experience.

Applications

NetBoot clients run most Macintosh applications available today. NetBoot does not include any special provisions for software licensing. You need to work with individual vendors to ensure that you have the appropriate number of licenses required by each application used on NetBoot clients.

Hard disk

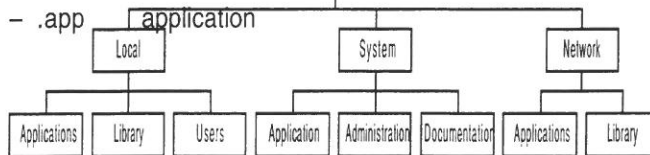
The NetBoot client does not normally use its hard disk drive. The NetBoot software includes a special system extension that unmounts the local hard disk drive, making it unavailable to the user. Administrators can disable this extension and make the local drive available for use. The local drive can be used in the normal way for storing files and applications and providing disk space for the computer's virtual memory requirements.

Requirements

The NetBoot server requires Mac OS X Server software running on a Macintosh G3 computer. The minimum recommended configuration is a 5GB hard disk and 64MB of RAM.

Directory structure

- Case sensitive
- Extensions



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Notes

Root

The top (or "root") level of your hard drive is called "/" ("slash" or "root"). The Mac OS equivalent is Macintosh HD. Folders are called "directories." Directories located at the root level are referred to as /<directory name>.

There are three default directories (folders) at the root level of the hard drive. /Local, /System, and /Network.

Local

/Local is for files specific to the computer you're on.

/Local/Applications/Internet/ - Contains OmniWeb.app, the web browser. Required for reading some help files.

/Local/Library/Receipts - Contains .pkg files - Essentially installer logs for what's installed on your computer.

/Local/Library/WebServer - Default location for your web files. Can be changed in the Setup Assistant.

/Local/Library/MacOS/Users/ - Location for each user's startup disk and PRAM setting.

/Local/Users - Home directories for each user.

System

/System is for files specific to the operation of the computer.

/System/Administration - The applications necessary for administering the computer.

/System/Applications - These are programs and utilities that come with the computer.

/System/Documentation - Contains Read Me files and System Help.

Network

/Network is for remote resources (devices, volumes, and users).

File names

File names are case-sensitive. myfile and Myfile are different files.

The part of a file name after the last period is called the "extension." Extensions can be of any length and usually indicate a file's type. Some common extensions are .app (application), .rtf (rich text format), and .mbox (mailbox). If a file has multiple extensions, separated by periods, the last extension is the one the system uses to determine the file's type. Renaming a file to change its extension does not change its file type.

Also note that XXX.app is really an application wrapper. This is essentially a folder that contains what we think of as resources (other languages, picture and text files). To view its contents, open the Contents inspector and click on the "Open Application Wrapper..." button or use the keyboard shortcut (Command-Shift-O)

Path names

If you are typing a file path, you can save time by using some shortcut notation for the relative path.

./ refers to the current directory.

./Stuff/thing.html would be a file called "thing.html" in a directory called "Stuff", located in the current directory.

../ refers to the parent directory. You can have a ../ for each directory away from the root directory that your current directory is.

This information may come in handy when trying to decipher file locations or when entering commands in Terminal.app or in the Workspace Manager "Go To" command under the Tools menu.

Expert Mode/Invisible files

Since Mac OS X Server is based on a Mach/BSD core, there are traditional Mach/BSD directories. However, these directories are hidden by default, in every account but the Administrator account. To view these files, you can choose "Expert" from the Preferences.app in /System/Applications (or under User Preferences in the Apple Menu). Expert mode can be triggered by changing to a directory that is only visible in Expert mode. To toggle back, update the viewer (command-U).

Note: Most tasks can be performed without having to use Expert Mode.

These additional items appear in Expert mode:

/bin - binaries, usually user-invoked commands

/cores - (core dump saved here after bad crash)

/dev - device driver interfaces. This is a link to /private/dev

/etc - directory where most configuration info is stored. This is a link to /private/etc

/lib - shared libraries

mach - a link (alias) to mach_kernel

mach_kernel - the kernel, the single most important file. This is the boot file listed in Open Firmware

/Net - a link to /Network/Servers

/private - contains /etc, /dev, /tmp, /var and more

/sbin - system-related binaries

/tmp - erased at restart. This is a link to /private/tmp

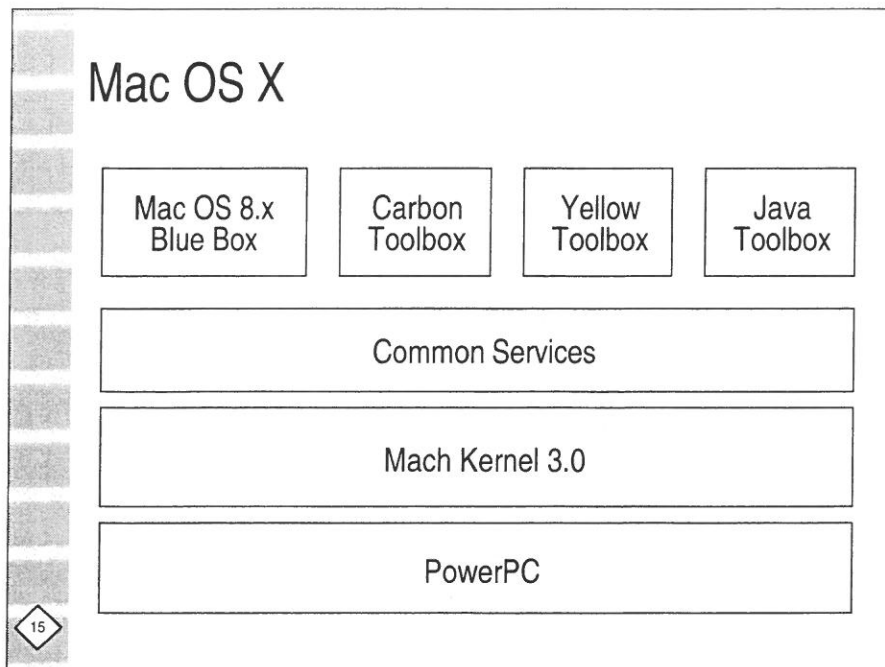
/usr - items related to applications and devices

/var - variables, spool and growable files and logs. This is a link to /private/var

.hidden - contains a list of files to be invisible in non-expert mode

.vol -

Files beginning with a dot are invisible.



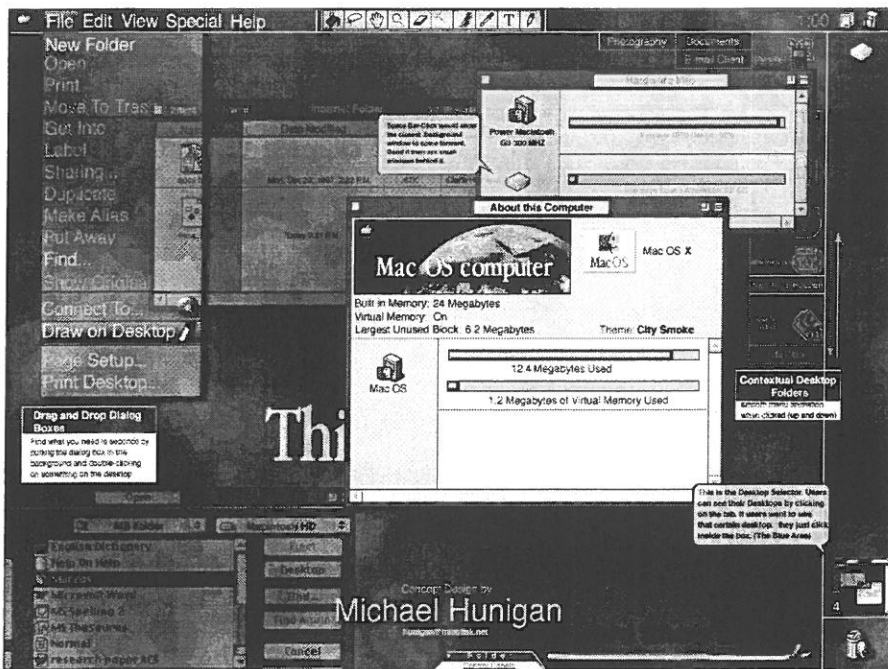
Notes

MacOS X

Apple's new advanced version of the Mac OS will be available to developers early in 1999 and ship in the fall of 1999. It will feature preemptive multitasking, memory protection and advanced virtual memory, and will be fully optimized for Apple's PowerPC G3-based computers. Mac OS X provides support for existing Macintosh applications, as well as providing a migration path allowing developers to leverage their existing source code. It also includes a breakthrough software development platform, code-named Yellow Box, for building new classes of reliable, media-rich, and cross-platform applications.

Carbon Toolbox

Carbon represents the core set of programming interfaces you can use to build Mac OS X applications that can also be deployed on Mac OS 8. Using Carbon you can take advantage of preemptive multitasking, memory protection, and dynamic resource allocation in Mac OS X while maintaining maximum source code compatibility with your current applications. Carbon includes most of the Mac OS functions that developers rely on today, while adding a small number of new functions to support Apple's goal of providing a more robust, responsive, and productive computing experience for our customers.



Notes

MacOS X preview

1. Highly Transparent Pulldowns: this method is used so you can easily see what is behind the menu ... It gives the OS a very futuristic feel.
2. The Open dialog box: as I have shown in the picture, you can put it in the background and double-click on anything in the hard drive or on the desktop. The mouse pointer will change to a different color and have the word "Open" across it.
3. Connect To: this is the same application that came with Mac OS 8. The only difference is that it is built into the OS.
4. Draw on Desktop: this function is basically a spin-off of Stickies ... It is an extreme powerful, updated version of Stickies that lets users draw anywhere they choose. A crude example is in the bottom right corner of the screen. An example of the paint toolbar is in the top/middle of the screen.
5. Pop-up window...: the ability to minimize even application windows to the "tab" state. Note the small dot on the left of the tab; users will have the ability to close the window without maximizing it.
6. Pop-down Desktop Folder: (Contextual was the wrong name to give it I think): this will replace the regular desktop folder. Instead of having 20 icons scattered all over the place, they will reside inside storage bins that only show the tools that a user needs. Note: this pop-down menu will show only the icon—the regular pop-up windows will show the regular information: size/label/date...
7. Desktop switcher: this option will give users the ability to use multiple desktops. This option may be very useful if you are using Netscape Navigator, PhotoShop, and PageMaker at the same time.
8. 20% Transparent windows: lets users truly see the entire desktop. Note: windows become transparent only if they are in the background.
9. Changing the look of the OS: with this design, the background picture makes a HUGE difference. When I was in the process of creating this picture I noticed that changing the background had twice the impact on the desktop than when using Mac OS 8. So users feel that they are at a different machine every time they change the desktop background.

Source: <http://www.macnn.com>