Macintosh Server G4 with Mac OS X Server

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Welcome to the Macintosh Server G4 with Mac OS X Server

Overview

Everyone knows that Apple makes incredibly great desktop computers. What few people realize is that Apple also makes incredibly great servers.

Apple's mission is to build the best personal computers in the world. However, we've realized that in order to deliver a great desktop computer experience, we need to deliver a great network experience as well. In today's networked world, the server plays an increasingly important role in the user experience. Apple's approach to servers is a logical extension of our commitment to make the best possible personal computers for our customers.

The new Macintosh Server G4 with Mac OS X Server is an extraordinary union of hardware and software. On the hardware side, Apple introduces the Macintosh Server G4, a computer with the first microprocessor that can deliver supercomputer-class performance. This phenomenally fast processor, the PowerPC G4 with Velocity Engine, easily handles the large and constant streams of data that flow through Internet and network servers. In addition, Apple has created an all-new superefficient logic board architecture with up to 1 gigabyte of memory, an Ultra2 LVD SCSI hard disk drive, and AGP graphics. On the software side, Mac OS X Server comes with Apple's most cutting-edge operating system and a full suite of valuable networking services such as Apache, WebObjects, and more.

Apple server products are available as a complete solution or can be acquired separately. The complete solution provides Mac OS X Server software preinstalled on the Macintosh Server G4 for maximum power and convenience. The server software can be purchased individually for those who intend to convert a Macintosh computer into a Mac OS X Server–based system. In addition, the Macintosh Server G4 can be purchased with AppleShare IP software preinstalled.

A new force in the server market

These powerful new choices in the server category rise to meet—and maybe even surpass—the needs of Internet, education, and publishing customers. We see three areas in which servers can improve the user experience for Apple customers:

• Connecting users to each other, whether via e-mail, file sharing, or general networking.
• Delivering Macintosh-generated media content. As you know, much of the media content in the world is created on Macintosh systems, and Macintosh users rely on servers to get that content out to paying customers, whether it's a printed page, a web site, or QuickTime media.
• Simplifying administration. Macintosh users want a tool that "just works." They don't want to become system administrators. We think servers can play a key role in managing configurations and reducing the total cost of ownership of Macintosh systems.

We created these extraordinary server products by following a few simple steps:

• *Take great hardware*—the most powerful, scalable Macintosh server that boasts supercomputer-caliber performance thanks to the PowerPC G4 with Velocity Engine and the all-new logic board architecture.
• *Package it with powerful software for Internet services and Macintosh workgroups*—our new Mac OS X core operating system based on Mach and BSD UNIX technology.
• *Add great third-party solutions*—an incredible array of innovative services, all based on proven, industry-standard technologies.

Apple has added to all this power the trademark simplicity and friendliness of a Macintosh, allowing easy installation, setup, and administration using familiar tools. Most customers can go from shrink-wrap to serving in less than 30 minutes. With Mac OS X Server preinstalled on a new Macintosh Server G4, users can be up and serving in 5 minutes.

Key Features and Benefits

• *Powerful, cost-effective hardware.* The Macintosh Server G4 runs the revolutionary PowerPC G4 with Velocity Engine at 500 MHz. This processor crunches data using true independent vector processing—a technology originally developed for use in scientific supercomputers. In addition, the computer's completely redesigned logic board provides efficient, high-bandwidth throughput among its subsystems. The result is unprecedented power and speed for the most demanding Internet, publishing, and education applications.

• *Robust core operating system.* Mac OS X Server is based on the Mach 2.5 and BSD 4.4 operating system technologies, which have been honed by decades of industrial use and academic research. These technologies run much of the Internet, and through features such as protected memory, preemptive multitasking, and full process management, they provide unparalleled stability for mission-critical applications. Mac OS X Server also fully supports 100% Pure Java and includes a compatible Java virtual machine based on Sun's JDK 1.1.6.

• *Innovative Internet and workgroup services.* On top of that powerful, open foundation, Apple has built an incredible array of innovative services—all of which are also based on industry-leading technologies. These include the Apache web server, the WebObjects network application server, the QuickTime Streaming Server, our new NetBoot software for managing multiple Macintosh systems, and Apple file services.

• *Scalability.* Both the core operating system and the added services of Mac OS X Server offer impressive scalability. The TCP/IP stack is capable of pushing hundreds of megabits per second out to the network. Apache and WebObjects can be used to run large Internet sites containing multiple domains and servicing millions of connections per day. The built-in file services can support more than 1,000 simultaneous users and more than 4,000 simultaneous open files. And the QuickTime Streaming Server can serve hundreds of stored files or reflect live broadcasts to more than 2,000 concurrent users.

Market Situation

Apple products are emerging as strong options in a server market that has traditionally been dominated by Windows NT Server and Solaris. Our goal was to produce the best server under $5,000, not a "big iron" enterprise server. By combining the UNIX-style capabilities of Mac OS X Server with a top-of-the-line Macintosh Server G4, Apple is now able to provide a robust and unique product that addresses many needs not met by traditional workgroup servers.

Prospective Customers

Mac OS X Server is designed for use by seasoned system and network administrators who typically are familiar with configuring and managing at least two of the following:

• AppleShare IP and At Ease for Workgroups
• Complicated networks, including routing between subnets
• Other UNIX servers, such as Solaris and Linux

The primary customers for these products are in the Internet, education, and publishing fields.

Internet

Mac OS X Server software offers the following benefits for organizations developing World Wide Web sites:

• The reliability and performance typically associated with much more expensive (and harder to use) systems
• A fully integrated version of Apache, the world's leading web server
• Leverage of existing UNIX expertise, tools, and code
• A license for deploying WebObjects, the premier tool for building enterprise-strength network applications
• The ability to deliver stored or live digital media with the QuickTime Streaming Server

Education

The combination of Macintosh friendliness with UNIX-style power results in an ideal server for education, from K–12 through higher education. Mac OS X Server software permits the development of a wide variety of solutions, whether users want to:

• Simplify iMac administration in a sixth-grade classroom
• Teach UNIX programming in a college computer science lab
• Distribute movies over the web for a distance-learning course
• Run a WebObjects registration program against the school's administration database

Publishing

The industrial-strength, standards-based foundation in Mac OS X Server software opens the door to a whole new category of solutions for Apple customers. Apple is pleased to be working with some of the leading names in publishing to create exciting server solutions, many available for the first time on Apple hardware. These include:

• File sharing and OPI (prepress) solutions from Helios and Xinet
• PDF workflows from Helios and oneVision
• Media asset management from Canto and WebWare
• Document workflow from Avatar Works
• Book and publishing management from SoftMagic

Product Details

Internet, education, and publishing customers have several options when choosing network servers with the Apple hardware/software advantage:

• Macintosh Server G4 with Mac OS X Server, a complete hardware and software server solution
• Mac OS X Server software only, for converting a previously acquired Macintosh computer into a Mac OS X Server–based system
• Macintosh Server G4 with AppleShare IP, server hardware with the easiest-to-use general-purpose server software

Macintosh Server G4

The hardware that runs Apple's new server is simply the fastest, most powerful computer in the history of Apple Computer. With a 500-megahertz PowerPC G4 processor and 256 megabytes of SDRAM (which can be increased up to 1 gigabyte), the Macintosh Server G4 can accommodate the most demanding needs of Internet, publishing, and education customers.

This configuration also comes with an enormous 18 gigabytes of storage capacity on an extremely fast hard disk that uses the latest Ultra2 LVD SCSI technology.

The PowerPC G4 with Velocity Engine

The heart of this new computer is a newly engineered, high-speed processor, the PowerPC G4 with Velocity Engine. The PowerPC G4 is so powerful that it clocks speeds best measured in gigaflops, or *billions* of floating-point operations per second. In fact, this processor can deliver a sustained performance of over 1 gigaflop and has a theoretical peak performance of 4 gigaflops. It can perform four (and in some cases, eight) 32-bit floating-point calculations at once, compared with one or two in traditional processors.

Conventional processors, such as the Pentium III, work on individual bits of data in sequence. However, the PowerPC G4 with Velocity Engine works on whole streams at once, up to 16 pieces of data, allowing work to be performed at exponentially faster rates.

Superhigh M.T.O.P.S. scores

Various methods of comparing the Pentium and PowerPC G4 processors confirm the design superiority of the PowerPC G4 with Velocity Engine. For example, according to the U.S. government's formula for M.T.O.P.S., the PowerPC G4 with Velocity Engine is more than twice as powerful as the Pentium III processor. This formula is a calculation of the power of the processor's design. Insomuch as power of design equals potential for performance, these numbers place the PowerPC G4 with Velocity Engine in a league above the Pentium III.

Millions of theoretical operations per second (M.T.O.P.S.)

Megahertz	Pentium III	PowerPC G4 with Velocity Engine
500 megahertz	1,167	2,875
550 megahertz	1,283	3,162

The U.S. government uses the M.T.O.P.S. calculation to determine which technologies are viable for export to foreign countries. Processors that score above a certain limit cannot be sold outside the United States without special government waivers. The Power Mac G4 achieved such high scores that it has caused Washington to take a fresh look at these upper limits.

The superior PowerPC G4 design shows in other ways. For example, look at how advanced the PowerPC G4 manufacturing process is.

Design efficiencies of the PowerPC G4 with Velocity Engine compared with the Pentium III

Feature	Pentium III	PowerPC G4 with Velocity Engine
Number of transistors	9.5 million	10.5 million
Die size	130 mm^2	83 mm^2
Power	40 watts	<12 watts
Process	.25μ aluminum	.22μ copper

New logic board architecture and subsystems

Another key innovation that advances the power and speed of this computer is a completely redesigned logic board. This new board moves data at such breathtaking speeds, and through such efficiently designed channels, that it increases the performance of all of the computer's subsystems.

This new architecture handles and manages more information faster than any other desktop computer. In order to accomplish this, we developed our own custom ASIC memory controller for the high-bandwidth system bus and a new custom ASIC I/O controller with the latest in ATA, USB, and wireless technology built right in.

Some of the outstanding features of the new logic board architecture are as follows:

• 100-MHz MPX system bus
• Dedicated industry-standard AGP 2X graphics slot with ATI RAGE 128 graphics card
• Ultra2 LVD SCSI hard disk drive

Maximum expansion

The Macintosh Server G4 with Mac OS X Server is a highly expandable computer, so network administrators can customize it to perform advanced, specialized file-serving functions. The easy-open case has an abundance of ports and slots, allowing for fast expansion in all areas.

The system has memory support for up to 1 gigabyte of high-performance PC100 SDRAM. Three 3.5-inch internal drive bays allow for more than 100GB of hard disk storage and a fast Ultra2 LVD SCSI hard disk drive comes pre-installed. Almost any combination of three ATA or SCSI hard disk drives can be arranged, with a maximum of

two ATA drives. Three 64-bit, 33-MHz PCI slots give network professionals even more options for expansion and performance. This server also offers unparalleled networking with a fast 10/100BASE-T Ethernet networking port and a four-port Ethernet PCI card for a total of five simultaneous Ethernet connections.

All told, the Macintosh Server G4 delivers tremendous file-serving power. And when you consider all that's included in the hardware/software solution, it also delivers tremendous value.

Mac OS X Server software and a suite of Internet and workgroup services
The Mac OS X Server software combines the new Apple operating system with a valuable suite of Internet and workgroup services. The server operating system is built on the core technology of the Mac OS X desktop operating system, scheduled for release in early 2000. In addition, an easy-to-use Setup Assistant has been created to help configure the system, so users can get a Macintosh Server G4 with Mac OS X Server up and running in less than 5 minutes.

Apache
Apache software running on a UNIX core (such as Mac OS X Server) is widely recognized as the best solution for web-serving needs. Indeed, Apache is the most popular HTTP server in the world, running more than half the web sites on the Internet according to the latest NetCraft survey (August 1999; www.netcraft.com/survey). Apache's momentum continues to grow, earning it numerous awards and endorsements by other companies.

Mac OS X Server includes a fully native port of the standard Apache distribution, providing Apache performance better than or equal to that of any other system in its class. We've created a Setup Assistant that requires only a single click to configure a basic Apache server. We've also included the standard UNIX tools so that administrators can configure Apache to support multiple hostnames and domains. And because this is a standard implementation of Apache, users can easily download and install the latest updates from the Apache Group to their Mac OS X Server systems.

WebObjects
WebObjects is the leading application server on the World Wide Web, probably because it's the most flexible and scalable way to develop and deploy applications that can be run from any web browser. It's a proven technology that has already been used to run thousands of mission-critical applications—including our own Apple Store. WebObjects is supported by an extensive array of consultant and developer partners through the Enterprise Alliance Program (www.apple.com/webobjects/alliances.html).

WebObjects 4.0.1 software is included with Mac OS X Server, along with a 50-transaction-per-minute license suitable for evaluation and deployment in small workgroups. We're even bundling it with the full suite of WebObjects developer tools so that users can create their own WebObjects applications. Unlimited deployment licenses and developer assistance are available from the Apple Enterprise Software group.

QuickTime Streaming Server
QuickTime is the Internet's most popular format for digital audio and video. With the introduction of QuickTime 4, media authors can deliver rich digital media in real time using the QuickTime Streaming Server. Using industry-standard real-time protocols (RTP and RTSP) and cutting-edge compression technologies, the QuickTime Streaming Server can serve more than 2,000 users on the Internet or deliver near-broadcast-quality video on fast local networks. And it can reflect an encoded audio or video stream in real time, so it's great for broadcasting live events such as classroom lectures, corporate meetings, or concerts. Along with QuickTime 4 and Final Cut Pro, the QuickTime Streaming Server makes Macintosh the best platform for capturing, editing, and delivering high-quality digital media.

NetBoot and Macintosh Management server

The most exciting new service in Mac OS X Server is NetBoot, a revolutionary way to simplify management of multiple Macintosh systems. NetBoot eliminates the need to configure individual computers, making it as easy to manage a network of systems as it is to manage a single Macintosh. Yet users can still have highly customized environments that can follow them to any Macintosh computer on the network. These capabilities make NetBoot a great solution for classrooms, labs, and workgroups.

NetBoot starts with a single powerful Mac OS X Server–based computer whose hard disk contains all the computing resources needed to run NetBoot-ready Macintosh computers. All connected NetBoot clients run from the same System Folder and application folders stored on the NetBoot server. Because everything is centralized, updating the server updates the whole network. So instead of installing a new application on every Macintosh on the network, administrators can just install it once on the server, and every NetBoot client automatically has it. NetBoot doesn't require any special applications; the same Macintosh programs available today can run without modification on a NetBoot client.

People use their computers in different ways, whether it's organizing documents, arranging icons and windows on the desktop, or just adding a cool desktop picture. The Macintosh Management component of the NetBoot server knows about each user on the network and keeps track of his or her identity. Users can securely access their personal desktops, files, and applications from any Macintosh on the network. Non-NetBoot computers can also use Macintosh Management services from anywhere on the network.

Apple file services

Mac OS X Server includes a highly scalable implementation of Apple file services. These services are capable of simultaneously supporting more than 4,000 open files and 1,000 users, over both TCP/IP and AppleTalk networks. Web-based tools make administration of these services extremely easy.

Mac OS X Server or AppleShare IP?

The Macintosh Server G4 is available with the Mac OS X Server software suite or with AppleShare IP. Given that both Mac OS X Server and AppleShare IP include high-performance file services, how should customers decide which product to buy?

AppleShare IP is the easiest-to-use general-purpose server software. It provides file, print, web, and mail services for both Macintosh and Windows clients. Its rich array of services includes POP and IMAP mail servers, Domain Name Service (DNS), and firewalls. For more information on AppleShare IP, please see www.apple.com/appleshareip.

Mac OS X Server, in contrast, is a specialized server targeted to customers who want to use one or more of its innovative new services (Apache, WebObjects, QuickTime Streaming Server, or NetBoot) or who need greater scalability in file serving. It does not include full e-mail and print services, and it does not directly support Windows clients for file sharing (although any web client on any platform can access the Mac OS X Server web services).

If customers need any of the following capabilities, they should choose Mac OS X Server instead of AppleShare IP:

• Configuring and updating multiple Macintosh systems from a single server
• Supporting more than 1,000 simultaneous Macintosh clients for file sharing
• Setting up a high-speed Apache web server
• Implementing a WebObjects application server
• Delivering QuickTime media

Third-party Products

From HTML authoring to prepress management, new products from other vendors complement the power and versatility of Mac OS X Server. The following are some of the demonstration products included on the third-party solutions CD that comes with every copy of Mac OS X Server. (Note: The product descriptions in this section were provided by the software vendors.)

Server products

Helios Software GmbH. Helios EtherShare is a high-performance AppleShare file and print server with an easy-to-use graphical interface for server administration. Helios EtherShare OPI is an Open Prepress Initiative (OPI) server that accelerates spooling and printing. It comes with a built-in ColorSync engine and ICC profiles that support multiple image formats. Helios PDF Handshake prints composites and separations of PDF files, and integrates PDF documents into any page layout application using OPI. Helios Print Preview produces a ColorSync-matched PDF preview of any composite or separation of a PostScript print job using the EtherShare spooler.

Canto. The Cumulus media management system software makes it easy to organize and manage digital media assets; find any file in seconds, no matter where it's stored or what file type it is; and enjoy powerful, integrated media access to anyone, anywhere, anytime.

Xinet. FullPress software is an "all-in-one" prepress solution that makes disk space use more efficient, reduces network traffic, and processes images more reliably. FullPress software running on a Power Mac G4 system makes it possible for even small shops to enjoy a powerful, reliable server; fast networking; and proven performance—all at a very manageable price. Included with FullPress are the Picture Wrangler image management extensions for QuarkXPress and the Color Verité color correction engine.

Avatar Works Limited. Avatar is a team collaboration and groupware solution that incorporates document management, messaging, and scheduling services. An entirely new product built especially for Mac OS X Server, it provides a rich user experience and permits team members to create a shared project space that provides personal, project, and organization focus.

Sassafras. KeyServer provides license management software for Mac OS, Windows, and thin clients.

Stalker Software, Inc. CommuniGate Pro is an Internet messaging server that supports such popular protocols as ESMTP, IMAP 4 rev. 1, POP3, web e-mail, LDAP, and ACAP. It's designed to provide access to hundreds of thousands of accounts while still being easy on resources and setup demands.

Lundeen & Associates. Web Crossing and Web Crossing/Chat are the leading software for web-based discussion services, newsgroups, uploading and downloading of document enclosures, and e-mail list integration.

Running Start. RSCommerce is the ideal platform for building powerful, flexible, and secure electronic commerce applications for the web. It is a comprehensive collection of applications and frameworks that web development teams can use to create everything from a simple online catalog to a web site that supports the entire sales cycle.

Additional third-party products for Mac OS X Server continue to be announced. Recent offerings include the Agfa Apogee OPI Server, PCShare, WebNative, and iTools.

Developer products

AAA+. Joy 2.1 takes users from interactively trying out C, Objective-C, and Java statements all the way through to deploying full-blown applications developed for Mac OS X Server. Joy Services 2.0 enhances users' workspace with scripted service menu items.

OpenBase. The OpenBase SQL Database Engine is the premier industrial-strength database for Mac OS X Server software.

P & L Systems. Mesa is a traditional Microsoft Excel–style spreadsheet. OpenUp lets users open and extract data from almost any type of archive. ColdCompress allows them to archive files and folders simply by dragging icons into a window.

ReportMill. ReportMill 2.1 is the leading reporting tool for WebObjects. It adds the power of dynamic reporting to web and database applications quickly and easily.

Stone Design. Create 5.0 is a complete design studio and web-building application. It includes a PostScript user environment, autotrace capability, easy importing and exporting of images, and much more.

SliceAndDice lets users create navigation bars and web images with hot spots; crop and copy images instantly; and produce HTML tables automatically. GIFfun is a free web tool that builds animated GIFs when users simply drop any kind of image into frames. With Pack Up And Go, users can archive files and folders by dragging icons onto the application icon, select compression and optional UUencoding, and keep track of compressed jobs.

Web Colors helps designers quickly select web-friendly colors, including both named and nondithering colors. Stone Web Color Lists add named and nondithering web colors to the standard color panel in every application.

TipTop Software. Objective-Everything is a must-have development environment for anyone who develops software for Mac OS X Server, including programmers who just want to program in straight Objective-C. It's ideally suited for rapid application prototyping and development, application scripting, regression testing, exploratory programming, and much more.

Product Pricing and Availability

Hardware/software solution: The Macintosh Server G4 with Mac OS X Server software is available in English, Japanese, French, and German. The estimated U.S. price is $4,499, including an unlimited license.

Software: Mac OS X Server software is available in English worldwide. It is also available in Japanese, French, and German. The estimated U.S. price is $499 for retail customers and $249 for education customers.

Support

Hardware/software solution: The Macintosh Server G4 with Mac OS X Server includes 90 days of free installation support via telephone that covers basic setup and configuration.

Software: The Mac OS X Server software product does not include complimentary telephone support. Users can purchase either per-incident support or annual agreements. Annual agreement contracts are available in both the U.S. and Canada for 5-day/12-hour support or 7-day/24-hour support.

Additional support: Extended hardware warranty and software support are available. Information for both products is provided via the AppleCare web site, mailing lists, and discussion groups, all of which are available at www.apple.com/support.

Software system requirements
System requirements for Mac OS X Server software are as follows.

Mac OS X Server
- Power Macintosh G3, Power Mac G4, Macintosh Server G3, or Macintosh Server G4 (does not support iMac, Macintosh PowerBook G3, or any earlier systems)
- 64MB of RAM
- 1GB hard disk

NetBoot client computers
- iMac, Power Macintosh G3 introduced in January 1999, Power Mac G4, Macintosh PowerBook G3 introduced in May 1999, or iBook computer*
- 32MB of RAM

*iBook computers cannot use NetBoot services over a wireless connection.

Macintosh Management client computers
- 68040- or PowerPC processor–based Macintosh computer
- Mac OS 8.1 or later
- 32MB of RAM

Macintosh Server G4 build-to-order options
In addition to prebuilt systems, Apple offers custom-configured computers through local resellers and the online Apple Store. This flexibility allows customers to select from among the options listed below. For up-to-date information about options and availability, visit www.apple.com/store.

Memory (PC100 SDRAM)
- 256MB
- 384MB
- 512MB
- 768MB
- 1GB

Hard disk drives
- One, two, or three 18GB 10,000-rpm Ultra2 LVD SCSI drives
- One, two, or three 36GB 7200-rpm Ultra2 LVD SCSI drives

Other options
- Ultra SCSI PCI card
- LaCie DDS-4 tape drive

Ordering Information

Macintosh Server G4 with Mac OS X Server
Order no. M7528LL/A

- Macintosh Server G4
- Apple USB Keyboard and Mouse
- Mac OS X Server operating system (preinstalled)
  —Apache web server
  —Apple file services with unlimited-client license
  —OmniWeb browser software
  —Mac OS compatibility environment
  —Java, Perl, Sendmail, FTP, Telnet, and NFS
- QuickTime Streaming Server (preinstalled)
- WebObjects Developer (preinstalled) with deployment license for 50 connections per minute
- NetBoot and Macintosh Management software (preinstalled) with unlimited-client license
- Complete setup, learning, and reference documentation

Product includes some electronic documentation. Bundled software provided on CD-ROM.