File Services

High-performance workgroup and Internet file sharing for Mac, Windows, and Linux clients.

Features

Native file services for Mac, Windows, and Linux clients

- Comprehensive file services using native protocols (AFP, SMB/CIFS, and NFS)
- Internet file sharing using FTP and WebDAV
- Unified file locking across AFP, SMB/CIFS, and NFS protocols

Access control lists (ACLs)

- Fine-grained file system permissions
- Ability to assign multiple user and group permissions for a single file and to set up groups within groups
- File system inheritance model
- Ability to restrict individual access to AFP, SMB/CIFS, and FTP protocols

Strong authentication

- Single sign-on support for AFP, SMB/CIFS, and FTP using Kerberos authentication
- Samba 3 for authenticated login of Windows clients
- Primary Domain Controller (PDC) and Backup Domain Controller (BDC) services
- Support for NTMLv2 authentication
- Single user name and password for users working on multiple platforms

Integration with existing infrastructure

- Support for accessing and authenticating user records in standards-based LDAP directories and Active Directory
- Resharing of NFS storage devices over AFP for secure remote access

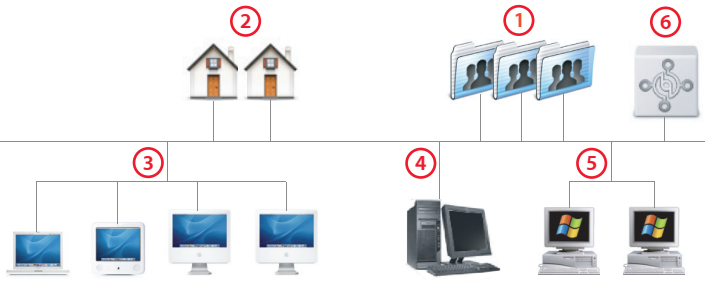
Superior manageability

- Easy remote setup and administration
- Support for per-user disk quotas and access privileges
- Real-time logs and graphs

Mac OS X Server provides an easy, cost-effective way for small businesses and departments to share network resources. Right out of the box, it delivers reliable, high-performance file services for Mac, Windows, and mixed-platform workgroups. And with the Unlimited-Client Edition, Mac OS X Server allows you to add clients as your needs grow—with no impact on your software licensing budget.

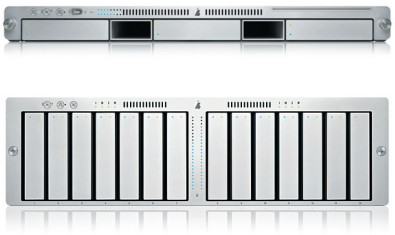
The latest version of Mac OS X Server, version 10.4, includes powerful features that enhance interoperability, maximize user productivity, and make file services more secure and easier to manage. For example, Kerberos authentication provides secure single sign-on to file services. New support for access control lists (ACLs) provides flexible file system permissions that are fully compatible with Windows Server 2003 and Windows XP. Mac OS X Server also integrates Samba 3 for delivering advanced SMB/CIFS capabilities for Windows clients, including support for authenticated login, home directories, and roaming profiles. And with Apple's innovative tools for remote administration, it's easy to configure services, manage users' access privileges and disk quotas, and view system traffic from virtually anywhere on the Internet.

File Services at a Glance



1. Server-based folders make it easy for mixed-platform workgroups to share documents, applications, and other resources.
2. Network home directories allow users to access their personal files and settings from any computer, anywhere on the network.
3. AFP file sharing supports Mac computers running Mac OS X, Mac OS 9, or earlier operating systems.
4. NFS provides file sharing for Linux and UNIX systems.
5. Samba 3 delivers native SMB/CIFS file services to Windows users.
6. Open Directory centralizes user account information in an LDAP directory and provides single sign-on authentication to file services.

Technology Brief
Mac OS X Server: File Services



An affordable NAS alternative
With low-cost storage, built-in services, and no per-user or per-seat licensing fees, Xserve G5 combines with Xserve RAID to offer an affordable, scalable alternative to network-attached storage (NAS) systems—without compromising on performance or capacity.

Native File Services

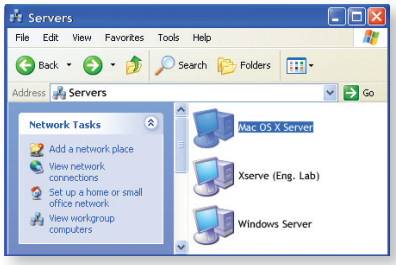
Mac OS X Server makes it easy for you to set up central network storage that's accessible to clients throughout your organization. Using native protocols, it delivers file services to all the clients on your network: AFP for Mac, SMB/CIFS for Windows, and NFS for UNIX and Linux, as well as WebDAV and FTP for Internet clients. These flexible cross-platform file services enable groups to work more efficiently, sharing resources, archiving projects, and backing up important documents. Mac OS X Server even works in organizations with an existing Active Directory deployment, allowing you to provide lower-cost file services while still integrating with Active Directory for user and group account information, permissions, and authentication.

AFP for Mac clients

The Apple Filing Protocol (AFP) remains the richest protocol for Mac file services. It allows any Mac system to access shared folders on the server, whether over the preferred TCP/IP protocol for Mac OS X clients or the legacy AppleTalk protocol for Mac OS 9 and Mac OS 8 clients.

Mac OS X Server uses Bonjour technology to provide automatic discovery of AFP file services, enabling Mac OS X clients to access available resources right in the Finder—without typing in the server's name or IP address.* AFP version 3.1 supports automatic reconnection of file servers, so shared disks don't unmount after extended periods of inactivity.

Hosting a network-based Library folder in Mac OS X Server makes it easy for you to distribute and update system resources across an entire workgroup. Mac OS X client systems automatically scan the contents of the network-based Library folder, and system resources in the folder are instantly available to the user with no configuration required. These resources are treated just like those stored on an individual computer's hard drive. For example, fonts stored in the network Library appear in the font menu of every application on the local system. By adding files—such as fonts, ColorSync profiles, application preferences, and templates—to the network Library, you can share them with all systems on the network.



Files hosted on Mac OS X Server appear in the Network Neighborhood of Windows clients.

Samba 3 and support for ACLs

Mac OS X Server v10.4 is the only UNIX-based operating system to implement file system ACLs that are fully compatible with Windows Server 2003 and Windows XP. Mac OS X Server also offers exceptional integration of Samba 3, the popular open source project that delivers high-performance SMB/CIFS file and print services and NT Domain services for Windows clients. Support for native service discovery protocols means that Mac OS X Server systems appear right in the Network Neighborhood—just like a Windows server—enabling Windows clients to browse folders and share files without having to install additional software.

Apple has integrated the NT Domain services in Samba 3 with Open Directory, the standards-based directory services and authentication server built into Mac OS X Server. Now you can set up Mac OS X Server as a Primary Domain Controller (PDC) or Backup Domain Controller (BDC) to provide login and authentication of Windows clients on your network. Support for NT Domain services also makes it possible for Mac OS X Server to host roaming profiles and network home directories for Windows clients. This makes Mac OS X Server ideal for replacing aging Windows NT or Windows 2000 servers, without requiring businesses to transition to an expensive Active Directory infrastructure.

Software RAID
Mac OS X Server supports drive striping (RAID 0) for improved performance, drive mirroring (RAID 1) for higher reliability, and mirrored striping (RAID 10) for improving both performance and reliability of server storage. In addition, Mac OS X v10.4 allows you to reformat storage in the background: You can promote a single volume to a mirrored volume, split a mirrored array into two volumes, or rebuild RAID volumes—without needing to take down the server.

NFS for UNIX and Linux clients
Enhanced NFS file services in Mac OS X Server deliver reliable, high-performance file sharing for UNIX or Linux desktop and server systems. Using NFS, Mac OS X Server can host data for UNIX application servers and provide integration with enterprise UNIX storage devices. Support for NFS file locking helps to ensure proper file access writes by preventing network users from inadvertently overwriting files being accessed by another user.

You can also use NFS services in Mac OS X Server to mount NFS volumes and reshare them over AFP with Mac OS X and Mac OS 9 clients. This allows client systems to access NFS volumes using the secure authentication and service discovery provided by an AFP connection.

Internet file sharing using FTP and WebDAV
Mac OS X Server features robust, easy-to-manage FTP file services for Internet file sharing from any platform. The FTP protocol provides the broadest compatibility across platforms, making it ideal for anonymous downloads or sharing files that are too large to be sent over email. Mac OS X Server improves the security of FTP services with Kerberos authentication. It also supports automatic resumption of disconnected FTP file transfers. If Internet access is interrupted, file transfers will resume where they left off. This saves time, especially for users with a slow connection to the Internet.

Mac OS X Server also supports WebDAV Internet file sharing as part of the built-in Apache web server. Originally designed for collaborative web publishing, this enhancement to the HTTP protocol turns a website into a document database, enabling collaborative creation, editing, and searching from remote locations. With WebDAV enabled, any authorized WebDAV client, on any platform, can open files, make changes or additions, and save those revisions back to the web server. And because it uses HTTP (port 80), WebDAV can support file sharing through firewalls that don't allow FTP sharing.

Managing File Sharing and Security

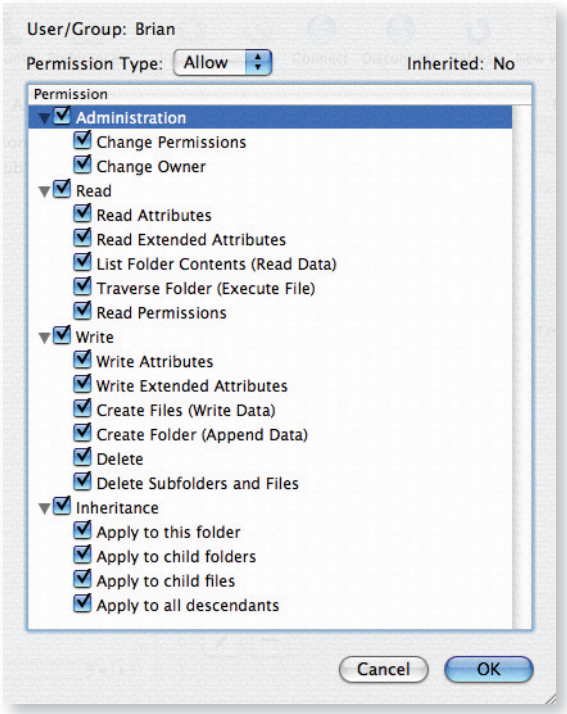
Mac OS X Server scales to meet the needs of just about any organization: It can be deployed as a stand-alone file server for small and medium-size businesses or integrated into a managed enterprise network for use as a corporate or departmental server. The built-in Workgroup Manager application provides an intuitive interface for setting up share points, assigning permissions, and managing user account information. This easy-to-use tool helps businesses and institutions of any size to streamline deployment of cross-platform file services and manage the security of digital assets.

Compatibility in heterogeneous environments
Apple's ACL implementation is compatible with POSIX 1003e draft. This enables full interoperability with the native permissions of Windows Server 2003 and Windows XP, while maintaining backward compatibility with traditional UNIX file permissions—making Mac OS X Server the ultimate platform for file sharing in mixed-platform workflows.

File system access controls
Mac OS X Server v10.4 supports both traditional UNIX file permissions and access control lists (ACLs), offering administrators an unprecedented level of control over file and folder permissions. Most UNIX- and Linux-based operating systems are constrained by the UNIX file permissions model, also known as Standard Portable Operating System Interface (POSIX) permissions. Standard UNIX file permissions allow you to assign one access privilege to the file's owner, one to a group, and one to everyone on the network. Multiple users and multiple groups are not allowed, nor is ownership by a group. The traditional UNIX model also lacks other important file access features: It supports only three permissions—read, write, and execute—and does not support permission inheritance, which enables new or copied files to inherit automatically the access controls of the parent directory.

To provide greater flexibility in complex computing environments, Apple has added support for ACLs in Mac OS X Server v10.4. With file system ACLs, any file object can be assigned multiple users and groups, including groups within groups. Each file object can also be assigned both allow and deny permissions, as well as a granular set of permissions for administrative control, read, write, and delete operations. For added security, Mac OS X Server supports a file permission inheritance model, ensuring that user permissions are inherited when files are moved to the server and rewritten when files are copied to the server.

With more fine-grained permissions options, administrators can control data access and improve security in workflows. For example, a group of users may be allowed to modify a file, but not to delete or even rename it.



In addition to the file permissions—read, write, and execute—supported in the traditional UNIX model, Mac OS X v10.4 lets you choose from a generous selection of ACL permissions.

Open Directory

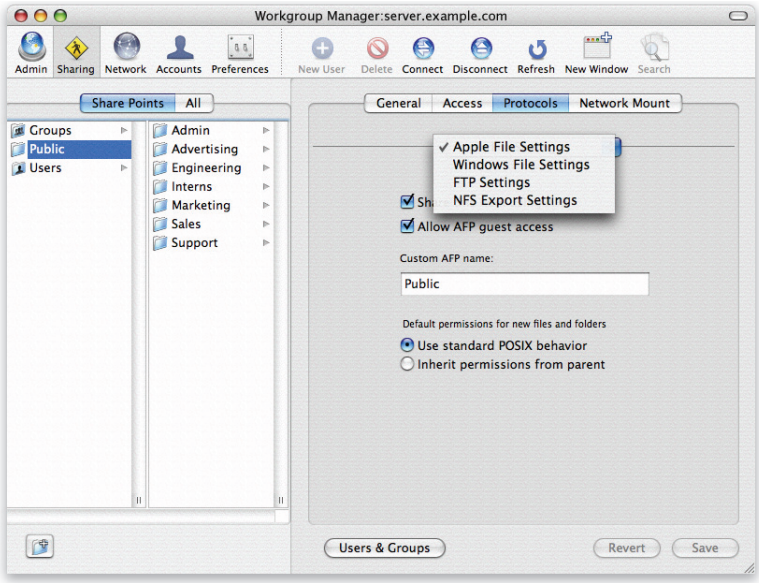
Mac OS X Server includes Open Directory, Apple's robust, scalable LDAP solution with integrated Kerberos single sign-on authentication. Based entirely on open standards, Open Directory is designed to work with the infrastructure you already have in place, supporting heterogeneous computing environments and integrating with existing directory and authentication services.

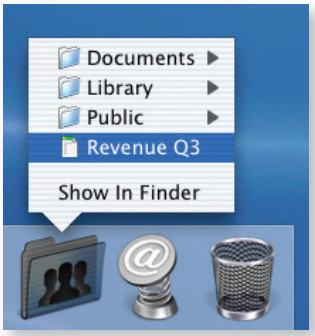
Managing user accounts

Workgroup Manager provides fine-grained control of user accounts on the server, including individuals' access privileges, authentication information, and disk quotas. For organizations with multiple servers, Workgroup Manager can access and store this user information in a central LDAP or Active Directory server, allowing it to be used by any system on the network. Directory-based management lowers administration costs and simplifies the task of securing network resources by allowing you to centrally define user identities, enforce password policies, and provide strong authentication to network services anywhere in your organization. Centralizing this information provides a better user experience as well, allowing clients to access shared folders and other network services from any platform, using a single user name and password.

Setting up share points

The Sharing function in Workgroup Manager allows you to set share points for both Mac and Windows systems. A share point is a folder, hard disk, hard disk partition, CD, or DVD that can be accessed over the network. Users with access privileges—which are assigned in Sharing—see share points as volumes mounted on the desktop or in their Network Neighborhood. Mac OS X Server supports Windows file sharing of any defined share point, not just Shared and Public folders in a user's home directory. It also supports Windows Internet Naming Service (WINS), allowing Windows clients across multiple subnets to perform name/address resolution.





Instant access to group folders
Using Workgroup Manager, you can designate group folders to automatically mount and appear in the Dock when a group member logs in.*

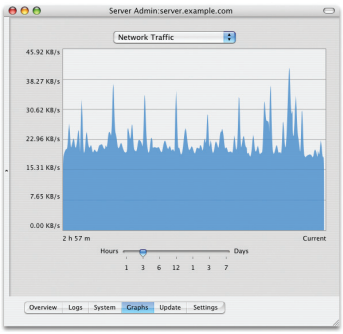
Efficient sharing of group resources

Workgroup Manager enables groups to work more efficiently by sharing files and folders. You can create a folder exclusively for members of a particular group and add documents and applications of special interest to group members. The group folder can be configured to mount on client systems automatically when a group member logs in.* Workgroup Manager ensures that all current and future members of a group can access these shared resources, and it automatically cancels access privileges for users who are removed from the group.

Hosting network home directories

Mac OS X Server supports hosting of network home directories over AFP, SMB/CIFS, and NFS protocols. That means you can create a single home directory for each user and provide authenticated access to it from any computer on the network—Mac, Windows, or Linux. Users always have their personal files and settings available, no matter what system, or even what platform, they're working on. Workgroup Manager also supports disk quotas, allowing you to limit the size of users' home directories to prevent abuse of server storage.

Network-based home directories make it easier for workgroups or classrooms to share a pool of computers. They also simplify storage and backup of user files: You can protect the assets of an entire workgroup just by backing up the server. And if a computer on the network requires maintenance, the affected user can simply log in to a different system and continue working—without transferring files or losing productivity.



With Server Admin, you can read real-time access and error logs and even view graphs of network traffic, throughput, and file service performance.

Remote Administration and Monitoring

The intuitive Server Admin tool allows you to configure services and change settings or permissions from any Internet-connected Mac OS X system. It also gives you fine-grained control over file server settings. For example, you can provide greater security by disabling access privileges for specific protocols. For improved usability and interoperability across file protocols, you can assign different names to the same server. This allows you to take advantage of AFP support for longer filenames and Unicode text, while making the server available to Windows and Linux clients using their more limited naming conventions.

Remote monitoring is just as easy. Server Admin displays the current status of all services running on your server. It identifies connected users, provides status information on file service settings, and even displays graphs of network traffic and throughput. This extensive information can help you plan allocation of server resources and be more responsive to the workflow needs of your network clients.

The full suite of Server Admin capabilities can also be accessed from the terminal using SSH—making setup and management easy for UNIX-savvy administrators who prefer a scriptable command-line environment.

Apple Server and Storage Solutions

Cross-platform file services are among the powerful workgroup and Internet solutions built into Apple's UNIX-based Mac OS X Server operating system. Combining the latest open source technologies with Mac ease of use, Mac OS X Server unleashes the power of Xserve G5, Apple's rack-optimized server hardware. With phenomenal performance, massive storage capacity, high-bandwidth I/O, and built-in remote management tools, Xserve G5 running Mac OS X Server is an unparalleled server solution for businesses, schools, and research centers. For even more capacity, organizations can add Xserve RAID storage systems—and share terabytes of data over an ultrafast Fibre Channel network with Xsan, Apple's new SAN file system. With unmatched integration between hardware and software, Apple's server and storage products allow you to extend your computing infrastructure, while lowering your management and maintenance costs.

For More Information

For more information about Mac OS X Server, Xserve, and other Apple server solutions, visit www.apple.com/server.

*Requires client systems with Mac OS X v10.2 or later.