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Beyond Installing FileMaker Server

For Mac OS X 10.4

- 1. Introduction**
- 2. Hardware**
 - 2.1. Processors**
 - 2.2. Storage**
 - 2.3. Memory**
- 3. Operating System Selection and Configuration**
 - 3.1. Screen Saver and Power**
 - 3.2. Network Settings**
 - 3.3. Disable Spotlight**
 - 3.4. Disable Dashboard**
 - 3.5. Updates**
- 4. Activity Monitor**
- 5. Timbuktu**
- 6. Rember**
- 7. SMARTReporter**
- 8. Install FileMaker Server**
- 9. Configure FileMaker Server**
- 10. Configure Local Backups**
- 11. Load Database Files**
- 12. Configure Offsite Backups**
- 13. Checklist**

Introduction

These instructions will document the installation, configuration, and deployment of a server running FileMaker Server on Macintosh OS X with all the tools required to administer it remotely. This documentation assumes that you are starting from scratch. If you have already completed some of the steps in this document, you may want to skip to the appropriate section. Just make sure you don't miss anything along the way.

Hardware

Before you install anything on your server, make sure it has a hardware configuration appropriate to its intended purpose.

Processors

All new hardware from Apple ships with dual processors. FileMaker Server can use some of the power provided by additional processor cores. Please note that a faster single

core can out perform two slower cores, as FileMaker Server does not utilize the second core as heavily as the first. More cores are good, but faster cores are better.

Storage

All production servers should have at least two hard drives installed. These may either be individual drives or RAID volumes. RAID uses multiple physical drives to simulate one drive with a larger size or greater performance. RAID 0 will provide the greatest performance increase, while RAID 1 and 5 will also provide hardware fault tolerance, but with a lesser performance gain. Additional concerns when selecting storage hardware include the RPM and cache size of the hard drives. Higher RPM and larger cache size translate almost directly into improved performance. Cost to benefit must eventually be considered, but the speed of a server's storage hardware will have a dramatic effect on its performance as a database server.

The first drive should be configured with an operating system and all the pertinent software. The second drive should be configured as a bootable backup. RCC uses Super Duper, a shareware volume copy program, to copy the primary hard drive to the backup hard drive. This setup ensures minimal upset should the primary hard drive fail, because the machine may be rebooted with the bootable backup, having only suffered a few minutes of downtime. Database servers should have an additional hard drive. This third drive holds backups periodically created by the FileMaker server software.

Memory

Memory is something that a server can always use in greater quantities. A single gigabyte of RAM is recommended as a minimum to ensure optimal performance. Any additional memory can be utilized to cache information for FileMaker Server or the operating system, further enhancing performance.

Operating System Selection and Configuration

Apple markets two version of their operating system: Max OS X and Mac OS X Server. RCC refers to Mac OS X as OS X Workstation to prevent confusion. Apple markets OS X Server for use in a server environment, but RCC has found OS X Workstation to be more suitable for use with FileMaker Server. OS X Workstation and Server are almost identical with Server having additional software for functionality unrelated to FileMaker Server. This additional software only consumes resources that could be used by FileMaker Server. Regardless of which version of OS X you choose to use it will need a few tweaks to make it behave well as a FileMaker Server. These configuration changes will ensure that OS X is ready to act as a server in a network environment.

Screen Saver and Power Settings

Servers are almost always on a KVM with the monitor turned off. Hence, there is no reason to have a screensaver enabled. Additionally, screen savers, when active, can use up an unreasonable number of CPU cycles, slowing database access as well as overall system performance. Set the screen saver to "Computer Name", and then set it to never turn on. Change the desktop background to a solid color, as this makes Timbuktu faster

in Control and Observe modes. Go to the Energy Saver and set the computer to never sleep itself, the monitor, or the hard drive.

Network Settings

Select the Network icon in System Preferences. Find an IP that not in use. Also verify that it is not used by a computer that is turned off at the moment. Set the following fields in the network properties dialog:

```
IP Address: xxx.xxx.xxx.xxx
Subnet Mask: xxx.xxx.xxx.xxx
Router: xxx.xxx.xxx.xxx
DNS Servers:
xxx.xxx.xxx.xxx
xxx.xxx.xxx.xxx
```

Click the Apply Now button to activate the new settings. Once this has been addressed, go to Sharing under System Preferences. Set the Computer Name to something that appropriately indicates its configuration, purpose. After this is finished, click the Edit button and change the hostname to the short name of the server (DB7, DB6, etc...).

Disable Spotlight Indexing in OS X 10.4

Spotlight is a wonderful and very useful tool that can be of great help when you are trying to find a file. However, the first time you watch a production server grind its hard drive and spike its CPU while Spotlight builds its indexes, this service suddenly becomes much less attractive. Fortunately there is an easy way to keep Spotlight from indexing while not interfering with searches. To disable Spotlight indexing on all drives currently mounted, make sure your user has Administrative privileges (you will need your password), open Terminal and type the following commands:

```
sudo mdutil -i off /Volumes/*
sudo mdutil -E /Volumes/*
sudo mdutil -i off /Volumes/*
```

These commands will disable and remove all indexes for the drives currently mounted. If you can, restart the computer to make sure the indexing stays off, as sometimes the indexing can turn back on after a reboot. Obviously, it would be unwise to reboot a production server with clients attached to databases. Also keep in mind that any drives attached to the computer afterward will have indexing automatically enabled. In the event this happens, just open Terminal again and type in the commands listed above to disable indexing on the new drive(s).

Disable Dashboard in OS X 10.4

Dashboard is another nifty feature in 10.4 that displays a screen of customized information at the touch of a button or the click of a mouse. This is all wonderful if you are sitting in front of a workstation and want to know what the weather is like out in the parking lot; however, on a server, Dashboard just uses memory that could be more efficiently applied elsewhere. The Dashboard doesn't load all your widgets into

memory until you activate it for the first time, so we don't really have to disable the dashboard, only make sure no one starts it. This can be taken care of by removing the Dashboard icon from the Dock and disabling the F12 shortcut in System Preferences under Dashboard & Exposé. Someone could still start the Dashboard from Applications, but the primary goal is to prevent it from being accidentally or incidentally opened.

Operating System Updates

Before installing FileMaker Server, you should make sure that the machine is ready. The first step is to ensure that all applicable updates have been applied. If you are on a slower connection, or installing from disks containing an earlier version of OSX, this can take some time. Once the machine is updated, take a moment and install a couple of utilities that are free, easy to install, and definitely worth your while.

Activity Monitor

The Activity Monitor, a free utility that comes with OS X, can be invaluable when diagnosing issues with a server. Find the Activity Monitor under /Applications/Utilities. After opening it, right click on the Dock icon and check the Open at Login option. Right click the Dock icon again and select the CPU History option from the Dock Icon menu. Now Activity Monitor should start on boot, and display the current CPU status in the Dock.

Timbuktu

Richard Carlton Consulting recommends the use of Netopia's Timbuktu remote control software for remote server administration. Timbuktu can be purchased and downloaded from <http://www.netopia.com/software/products/tb2/>. Install Timbuktu by copying the Application from the mounted disk image to Applications. Un-mount the disk image and launch Timbuktu from Applications. Provide your password when asked. In order to access the computer remotely, you must click the Timbuktu icon on the menu bar and check the TCP/IP Incoming Access option. The final step is to insure that everyone that needs a Timbuktu account on the machine has one.

Rember

Rember is a memory tester that can run as a regular application, without opening your computer's case to extract anything or even rebooting. Download the Rember disk image from <http://www.kelleycomputing.net:16080/rember/> and mount it. Just drag the program to applications and double-click to run it. Rember will grab as much memory as it can and test it aggressively. While it is testing all the memory it has locked up, the computer will probably be more than a tad sluggish, so it would be best not to use any other applications while Rember is running. In the event that your computer will not boot properly, or has a massive kernel panic before you can run Rember, try to boot the computer into single user mode by holding Command-S while booting. Run Rember from the command line by typing:

```
"/Applications/Rember.app/Contents/Resources/memtest all all"
```

This command will test all of the memory it can until it is stopped. You can stop memtest by pressing Control and C at the same time or rebooting the computer.

SMARTReporter

SMARTReporter is an invaluable tool that can save you a great deal of grief. SMART is a standard method for a drive to report its current state of health. SMART is supported on almost all newer drives, but many FireWire and USB external enclosures don't support SMART. For those drives that work with SMART, SMARTReporter will monitor the drive and warn you if it is about to fail. It can be configured to change the color of its icon in the menubar, display a dialog box, or even send you an email. An email notification is especially useful if you have a server stashed in some dark corner out of sight. Instead of rushing out to fix the server AFTER it crashes, you now have the opportunity to verify or run backups, notify users, and generally deal with the problem in a less panicked manner. One last thing to remember is that while SMART will catch many drive failures, it will not catch them all. So be sure to keep good backups, and when SMARTReporter lets you know your drive is dying, you can just back it up and swap it out.

Installing FileMaker Server

Go ahead and dig out your FileMaker Server CDs. Find the disk labeled "FileMaker Server 8" and insert it into the CD drive. When the CD is mounted in the Finder, click on the volume. Click on the icon named "FileMaker Server 8" and it will launch the install program. When prompted, supply a username and password for an administration account on the Database Server. Agree to the license and click install. FileMaker Server may take a moment to install. When prompted, select the option to automatically start the processes on boot. You will need to reboot after the installation is complete. Make sure that you have the latest updates for FileMaker Server. If your install disks are 8v1 or 8v2, make sure to update to the latest version. If you have 8v1, you will need the 8v1→8v2, 8v2→8v3, and 8v3→8v4 updates. If you are using 8v2 you will need only the last two of the three updates. You can download the updates from <http://www.filmaker.com/downloads>.

You will need to stop the FileMaker Server before applying the updates. Open the FileMaker Server Admin. From the Server menu, select "Stop FileMaker Servers." Close the FileMaker Server Admin. There is still a stray FileMaker process that needs to be stopped. Open the Activity Monitor and select the `fmsserver_helperd` item. Click the "Force Quit Process" button to stop this process. When prompted, supply the username and password for an administrator account on this computer. With all the FileMaker Server processes stopped, the updates can now be installed. Click on the .dmg file to mount it in Finder. Open the volume, and run the FileMaker Server Updater. Supply the username and password for an administrative account when prompted. Click "accept" to agree to the license, and click the "install" button to start the update. When it is finished, restart the computer.

Configure FileMaker Server

After the reboot, open the FileMaker Server Admin. Select the entry called (localhost) and click Connect. In the window that will open, click the Configure icon on right. Select the Databases tab. There are two changes to make here. Change the maximum number of files to host from 50 to 125. Once that is done, go ahead and set the database cache to the maximum size possible. This will ensure that FileMaker Server gets the most out of the available memory.

Configure Local FileMaker Backups

The task of configuring an appropriate backup setup can seem arduous, but it is well worth it. You should have a drive labeled "Database Backup." On this drive, (which should be empty)

create a series of directories. For hourly backups create twenty-four folders starting with 0000 and going up to 2300. For daily backups create thirty directories starting with Day 01 and going to Day 30. Create one final directory called Half Hour Backup.

You should now have a total of fifty-five directories like this:

0000	0800	1600	Day01	Day09	Day17	Day25
0100	0900	1700	Day02	Day10	Day18	Day26
0200	1000	1800	Day03	Day11	Day19	Day27
0300	1100	1900	Day04	Day12	Day20	Day28
0400	1200	2000	Day05	Day13	Day21	Day29
0500	1300	2100	Day06	Day14	Day22	Day30
0600	1400	2200	Day07	Day15	Day23	Half Hour Backup
0700	1500	2300	Day08	Day16	Day24	

Now that the backup directories have been created, their permissions need to be adjusted. Set the owner for all fifty-five directories to fmserver and the group to fmsadmin. The user and group should have read and write permissions, while others should be set to read only.

After the directories have been created, the backup schedules themselves can be configured. Open the FileMaker Server Admin and click the schedules icon. For each of the backup directories, we will create a corresponding backup schedule. Start with the hourly backups. Create a new schedule. In the window that pops up, set the name of the schedule to 0000. Change the Back Up Folder to the path of the folder we created earlier. Don't forget to include the trailing slash. Set the start time to 00:00, the date does not matter at this point. Make sure that the schedule is set to repeat "Every: 1 days" but NOT every xx hours or minutes. Now you can duplicate this schedule twenty-three more times, changing the name, folder, and start time for each duplicate. Now make a duplicate of an hourly schedule. This duplicate will be our first daily backup. Change the name of the Schedule to Day01. Set the Back Up Folder to point to the Day01 folder. Change the date to the first of the month and the time to 23:00 (or whenever you expect the working day to end). Finally, set the schedule to repeat "Every: 30 days". Save this schedule, and duplicate it twenty-nine more times, changing the name, Back Up Folder and Start date for each duplicate. The last backup schedule is the Half Hour Backup. Make a new schedule and name it Half Hour Backup and make sure the Back Up Folder is set to the folder having the same name. Set the start date for today and the time to 00:30. Set the schedule to run every day and repeat every hour. Go back and double check your settings for the backup schedules. Once you are satisfied that the schedules are set up correctly, we can start loading database files onto the server.

Load Database Files

Locate all the databases you want to run on the server and place them in:

```
/Library/FileMaker Server/Data/Databases/
```

Generally it is best to place each solution (one or more databases working together) in its own subfolder. Create subfolders as needed and make sure that each database is where you want it to be. Once all the folders are placed where they need to be, ensure that all directories and files in the Databases folder have the following permissions:

```
Owner: fmserver  
Access: Read & Write  
Group: fmsadmin
```

Access: Read & Write
Others: Read only

After all the database files have been loaded and their permissions corrected, go to the FileMaker Server Admin. Click the Databases icon. From the Action menu select Refresh View from the Databases submenu (Action>Databases>Refresh View). You should now see all the database files you copied earlier. Open the files you want to be served from FileMaker Server by right clicking each and selecting Open. If you wish to open several files that are in a single folder, you can right click on the folder and click Open, and that will open all databases in that folder.

Configure Off-Site Backups

Off-Site Backups are something you hope you will never have to use. In an ideal world they would serve no purpose at all: drives would fail one at a time, if ever at all, and you would just restore from the previous local backup. Unfortunately life often does not work that way. Off-Site Backups are configured to copy local backups to a computer located in another room, building, or state. Off-Site backups are a relatively simple setup. You only need to create one file (the backup script), and add one line to a system configuration file. Mount a shared volume on the machine from which the offsite backups will be written. Open Accounts under System Preferences and drag that volume into the Startup Items. The blue highlighted text below is the destination path for the backups. When you have mounted the backup drive change the blue highlighted text below to the desired destination directory. Change the output file name (the part highlighted in yellow that says `$(date +""DB3 %Y %b %d — %H%M""").zip""`) to reflect the name of the computer that the backup was made from. Usually you only have to change DB3 to the name of the machine, i.e. DB7, DB9, etc. Open the terminal and type the following text (after editing it):

```
sudo echo "/usr/bin/nice -10 /usr/bin/ditto -c -k -rsrc  
"/Volumes/Database Backup/Half Hour Backup/" "\" /Volumes/Backup2/DB3  
Compressed/"$(date +""DB3 %Y %b %d — %H%M""").zip"" >  
/Users/Shared/backup_v2.sh; sudo chmod 777 /Users/Shared/backup_v2.sh; sudo  
chmod 777 /etc/crontab; sudo echo  
$'40\t*\t*\t*\t*\troot\t/Users/Shared/backup_v2.sh' >> /etc/crontab; sudo  
chmod 644 /etc/crontab
```

Before we test the backup script, go back to FileMaker Server Admin and run the Half Hour Backup by selecting it, right clicking it, and choosing “Run Schedule.” This will run the Half Hour Backup and give the backup script files to copy. We will need to execute one more command before we exit Terminal. This command will run the backup to make sure the backup script is configured properly:

```
/Users/Shared/backup_v2.sh
```

This should produce a file on the offsite backup in the folder that you previously configured. Open the zip file and check to make sure that you have the right files from the desired timeframe. You may also want to wait until a backup or two runs automatically, to ensure the scheduling is working properly.

Conclusion

Take a moment to verify that you have completed all of the steps in this document. Make sure that everything is working properly. Stop and try to remember if there was anything else you needed to install or configure beyond the normal FileMaker Server. Once you have tested everything and made sure everyone can access the databases, you are finished. Congratulations.

Checklist

- 1. **Introduction**
- 2. **Hardware**
- 3. **Hard Drives**
- 4. **Memory**
- 5. **Operating System**
- 6. **Screen Saver and Power**
- 7. **Network Settings**
- 8. **Disable Spotlight**
- 9. **Disable Dashboard**
- 10. **Updates**
- 11. **Activity Monitor**
- 12. **Timbuktu**
- 13. **Rember**
- 14. **SMARTReporter**
- 15. **Install FileMaker Server**
- 16. **Configure FileMaker Server**
- 17. **Configure Local Backups**
- 18. **Load Database Files**
- 19. **Configure Offsite Backups**