FileMaker® Server 14

Getting Started Guide

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Edition: 01

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Chapter 1
Introduction

Welcome to FileMaker® Server 14. FileMaker Server is a dedicated database server that opens FileMaker Pro files, makes them available to other machines on a network, and publishes FileMaker data in web pages on the Internet or a company's intranet. FileMaker Pro is an application for creating and modifying database files.

Before you install, confirm that your machines meet the minimum requirements. For information on the minimum hardware and software requirements, see http://www.filemaker.com/r/fms-specs.

Requirements for Admin Console

FileMaker Server Admin Console is a web-based application that lets you configure and administer FileMaker Server. You can use Admin Console on machines that have network access to FileMaker Server and a supported web browser.

Supported client applications

FileMaker Server supports the following client applications:

- FileMaker Pro 12, 13, and 14
- FileMaker Go® 12, 13, and 14
- ODBC (Open Database Connectivity) and JDBC (Java Database Connectivity) client applications using the FileMaker client drivers
- Web browsers (or other applications) accessing data through the FileMaker Server 14 Web Publishing Engine

Note Because of security improvements in FileMaker Server 14, FileMaker Pro 12 and FileMaker Go 12 clients may not be able to connect to databases hosted by FileMaker Server 14 if the **Use SSL for database connections** setting is enabled in FileMaker Server Admin Console.

Your copy of FileMaker Server can host up to 125 databases at the same time for the following simultaneous client connections:

Client	Supported connections
FileMaker Pro	Unrestricted
Custom Web Publishing	Unrestricted
ODBC and JDBC	Unrestricted
FileMaker Go and FileMaker WebDirect	One. You can purchase a license for additional connections.

Note Although FileMaker Server allows an unrestricted number of simultaneous connections for all client types except FileMaker Go and FileMaker WebDirect, most operating systems impose their own limits on the number of network connections and open files that a process may use. This operating system limit sets the effective limit on the number of simultaneous client connections.

About the license key

FileMaker software comes with a unique, 35-character license key. Do not lose this license key. We recommend that you keep the license key in a safe place in case the software ever needs to be reinstalled.

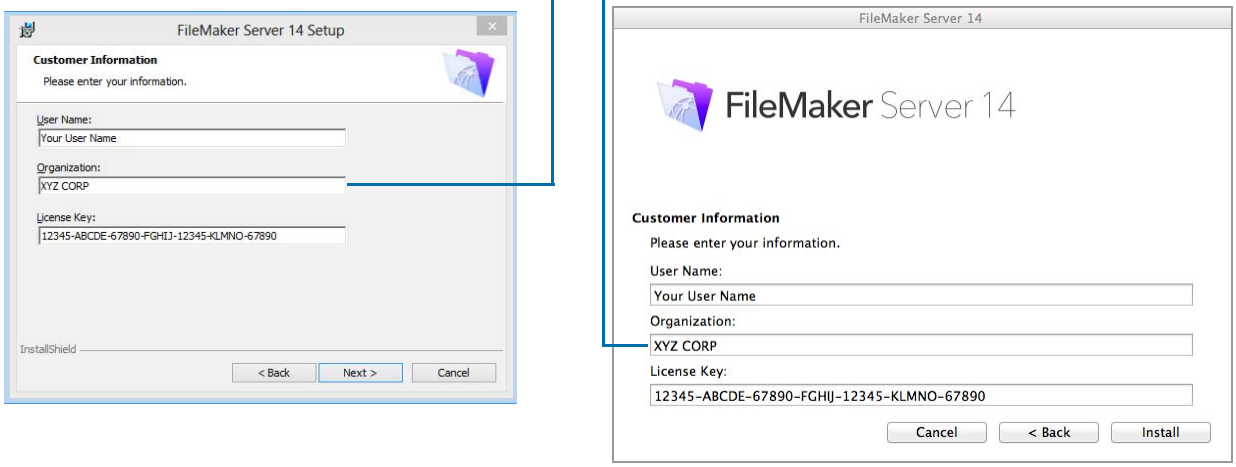
You received an email message with a link to your software download page. Your license key can be found on that page.

The license key is customized for your organization. When installing software, enter the organization name exactly as it appears on the software download page. For example, the software download page may show this information:

The organization name and license keys below are both required to install your software. We recommend that you print this page, and retain a copy for your records. For installation, the software requires the entry of information exactly as it appears here:

Organization Name: **XYZ CORP**

License: **12345-ABCDE-67890-FGHIJ-12345-KLMNO-67890**



The license key ensures adherence to the single user license agreement, which generally allows for use of one (1) copy of the Software on one single-machine deployment or on one multiple-machine deployment at a time (refer to your Software License). If the license key is invalid or if another copy of the software installed with that same license key is running on the network, the FileMaker Server software displays an error message.

You can choose to deploy FileMaker Server components across two machines that work together to form a single FileMaker Server deployment. You must have a unique license key for each two-machine deployment, or obtain a volume license for more than one deployment. You must license one copy of FileMaker Server for each deployment.

Updating the FileMaker Server 14 license key

You can enter a new license key for FileMaker Server 14 on the same machine to do the following:

- upgrade from a trial version of FileMaker Server 14
- add support for more FileMaker Go and FileMaker WebDirect connections

To change the FileMaker Server license key of an existing deployment:

1. From the FileMaker Server Admin Console, choose the **General Settings** > **Server Information** tab. See “Starting Admin Console” on page 52 for information on how to start Admin Console.
2. Click **Change License Key**.
3. In the Change License Key dialog box, enter the information required, then click **Update**.

Note To move your FileMaker Server 14 deployment to a new machine or to upgrade from an earlier version of FileMaker Server, see chapter 6, “Upgrading or moving an existing installation.”

Where to go from here

- To install on a single machine, see chapter 2, “Installation quick start.”
- To install using a two-machine deployment, see chapter 3, “Deploying FileMaker Server across multiple machines.”
- To move from an existing installation of FileMaker Server, see chapter 6, “Upgrading or moving an existing installation.”

Chapter 2
Installation quick start

This chapter explains how to install FileMaker Server on a single machine.

Before you begin

Here is a list of things you must do before installing FileMaker Server:

- To install on more than one machine, see chapter 3, “Deploying FileMaker Server across multiple machines.”
- FileMaker Server requires a web server in all deployments. The web server serves web publishing clients, hosts the web-based Admin Console application, and handles some data transfer tasks. FileMaker Server requires that a port for web connections and a port for secure web connections is available on the web server. The default ports are port 80 and 443, though you may specify alternative ports during installation. These ports are used by FileMaker Server even if web publishing is disabled. If the FileMaker Server installer detects existing websites using these ports, the installer prompts you to either specify alternative ports or let it disable those websites.
  - **Windows:** The FileMaker Server installer runs the Microsoft Application Request Routing (ARR) installer (which enables the IIS web server if it isn’t already enabled), creates its own website in IIS, and configures the website to use the ports specified for web connections.
  - **OS X:** The web server included in OS X does not need to be enabled; if it is enabled, ensure that no existing website uses port 80 or 443, or be prepared to specify alternative ports during installation. The installer creates a separate web server instance and enables it for FileMaker Server to use on these ports.

  For more information on the web server, see chapter 7, “Setting up the web server.”
- If your server computer has a firewall, open the necessary ports in the firewall so that FileMaker Server can communicate with administrators and clients:
  - Web connections port: 80 by default, but you may specify a different port during installation. This port is used by Admin Console and for web publishing (HTTP).
  - Secure web connections port: 443 by default, but you may specify a different port during installation. This port is used by Admin Console and for web publishing (HTTPS) if SSL connections are used.
  - Port 5003 for FileMaker clients.
  - Port 16000 for server administrators using Admin Console.
  - Port 2399 for ODBC and JDBC clients.
  - Ports 1895, 5013, 5015, 8998, 9889, 9898, 16001, 16020, 16021, 50003, and 50004 must be available on the machine, but not open in the firewall.

  For detailed informations about ports, see “Ports used by FileMaker Server” on page 26.
- To upgrade from an earlier version of FileMaker Server, see chapter 6, “Upgrading or moving an existing installation.”

- Locate your license key. See “About the license key” on page 7.
- If you are currently running FileMaker Pro on the same machine, you must quit FileMaker Pro before installing FileMaker Server.

Also keep in mind the following:

- If the machine has anti-virus software installed, you may need to disable or uninstall it before running the FileMaker Server installer. Don’t enable anti-virus software again until after the Deployment assistant has finished.

  Do not allow anti-virus software to scan the folders that contain hosted database files or the folders that contain files for container fields that store data externally.
- You cannot run two different versions of FileMaker Server on the same machine at the same time.
- Because some DHCP servers cycle IP addresses, FileMaker recommends using a static IP address.
- **OS X:** Avoid using the OS X Server application to enable any HTTP services while running FileMaker Server. HTTP services provided by OS X Server can interfere with FileMaker Server. See “Using the Apache web server in OS X” on page 76.

Considering performance

For best performance, run FileMaker Server on a dedicated machine reserved for use as a database server. When FileMaker Server is hosting many clients or a large number of database files, it uses a high level of processor, hard disk, and network capacity. Other processor-intensive software or heavy network traffic on the same machine will cause FileMaker Server to run more slowly and degrade the performance for FileMaker clients.

To improve performance:

- Avoid installing FileMaker Server on a machine that is a user’s primary workstation.
- Avoid using the machine running FileMaker Server as an email, print, or network file server.
- Do not use system or third-party backup software to back up databases hosted by FileMaker Server. Instead use FileMaker Server Admin Console to schedule backups of databases. See “Backing up databases” on page 55.
- Disable screen savers and sleep (or hibernate and standby) mode on the server. These features reduce performance or suspend access to hosted databases.
- Use a fast hard disk, multiple-disk RAID system, or reliable Storage Area Network (SAN) for the hosted databases.
- Turn off Indexing Service (Windows), Spotlight (OS X), or any other third-party file indexing software. This feature reduces performance.

For more tips to improve performance, see chapter 8, “Optimizing your FileMaker Server deployment.”

Installing FileMaker Server on a single machine

1. Follow your electronic download instructions to download and open the installation disk image.
2. Double-click the installation icon.

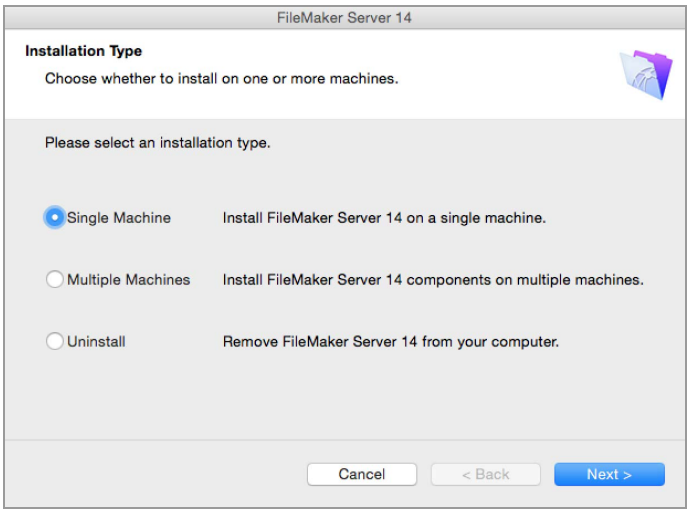
FileMaker Server 14 (OS X)

Setup (Windows)

   - **Windows:** If a User Account Control alert appears, click **Yes**.
   - **OS X:** Enter your OS X user name and password, then skip to step 5.
3. **Windows:** Select a language, then click **OK**.
4. **Windows:** To begin installation, click **Next**.
5. Read the Before You Begin information. If there is a task you did not do, quit the installer and do the task. If you are ready to install FileMaker Server, click **Next** (Windows) or **Continue** (OS X).
6. Review and accept the end user license agreement.

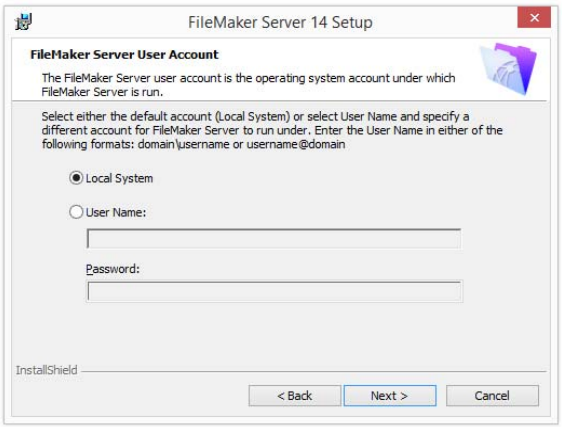
   OS X: You may need to enter your OS X user name and password again.
7. **Windows:** Select a destination folder, then click **Next**.

   Note In Windows, you can select a non-default location. See “Installation notes” on page 43.
8. Select **Single Machine** and click **Next**.

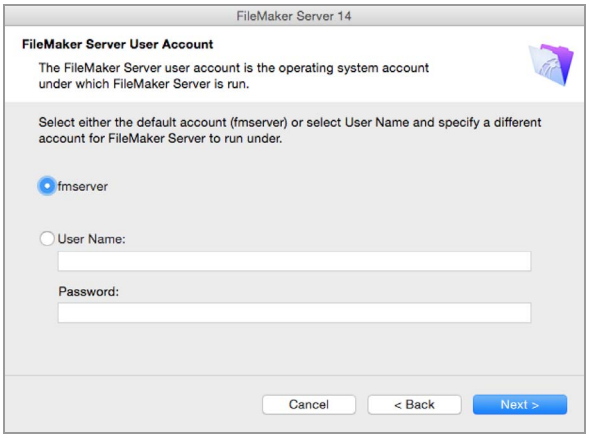


9. Choose one of the following options for the FileMaker Server user account (the account under which you want to run FileMaker Server):
   - To use the default account, select **Local System** (Windows) or **fmserver** (OS X), then click **Next**.
   - To use an existing account on this machine, select **User Name**, enter the account's user name and password, then click **Next**. You may want to choose this option if you already have an account that has privileges set as you want—for example, to access network-attached storage.

     If the existing user account you specified does not have sufficient privileges for FileMaker Server to run, the installer displays an error message. For more information, see "Installation notes" on page 43.



Windows



OS X

10. Specify the ports that FileMaker Server should use for web connections and secure web connections, then click **Next**.

    If the installer detects that the ports required for the web server are currently in use, the installer prompts you to let it disable the website currently using those ports. To continue installation, you must click **Disable Websites**. Or you can click **Cancel**, disable the website manually, then run the installer again.

11. Enter the user name, organization, and license key information.

12. **Windows:** Click **Next**.

13. Click **Install**.

- **Windows:**

  If you do not have the Microsoft Visual C++ 2013 Redistributable Package (x64) or a minimum update of Java Runtime Environment version 8, the FileMaker Server installer automatically installs them.

  If you do not have Bonjour for Windows installed, you are prompted to allow the FileMaker Server installer to install it. Follow the onscreen instructions.

  If you do not have the Microsoft Application Request Routing (ARR) extension for IIS installed, the FileMaker Server installer downloads and installs it. If your machine cannot access the Internet, you need to download and install this extension manually before the installer can continue. If IIS is not enabled, the ARR installer will enable it.

  For more information, see “Installation notes” on page 43.

- **OS X:**

  If you do not have a minimum update of Java Runtime Environment version 8 installed, you are prompted to allow the FileMaker Server installer to install it. If Bonjour is not running, you are prompted to run it.

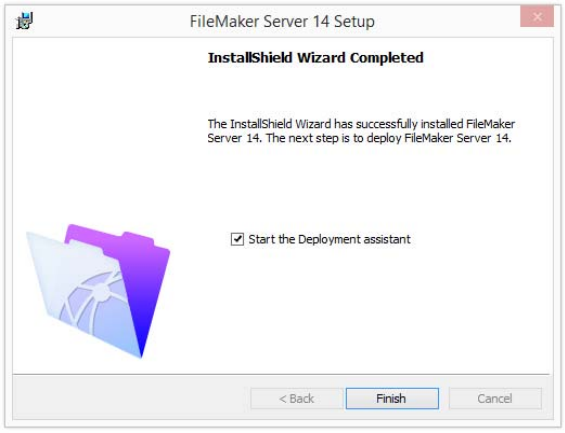
  For more information about Java and Bonjour installation, see “Installation notes” on page 43.

FileMaker Server begins to install. This process may take several minutes.

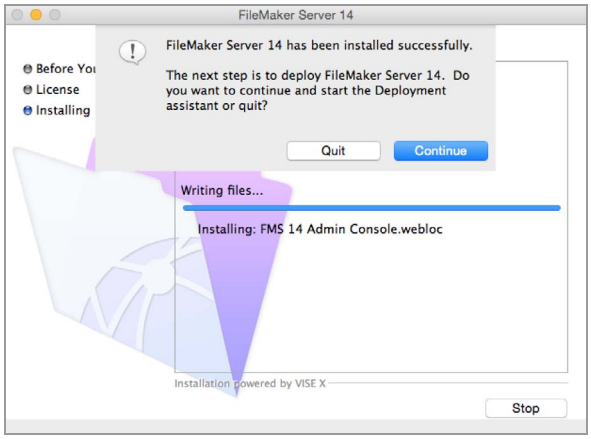
14. After the software has been successfully installed, start the Deployment assistant.

- **Windows:** In the last step of the installer, select **Start the Deployment assistant**, then click **Finish**.
- **OS X:** Click **Continue**.

If necessary, see “Deployment assistant doesn’t start after installation” on page 47.



Windows



OS X

If you want, you can stop now and start the Deployment assistant later. To deploy FileMaker Server at a later time:

- **Windows 8, Windows Server 2012 R2:** On the Windows Start screen, click **FMS 14 Admin Console**.
- **Windows Server 2008 R2:** Click the **Start** button > **All Programs** > **FileMaker Server** > **FMS 14 Admin Console**.
- **OS X:** Double-click the **FMS 14 Admin Console** shortcut on the desktop.

The Deployment assistant opens in the web browser. It may take a few minutes for Admin Console to start and the Deployment assistant to appear.

Note If Admin Console and Deployment assistant do not start, see “Deployment assistant doesn’t start after installation” on page 47.

15. In the first step of the Deployment assistant, assign the user name and password you want to use whenever you log in to Admin Console as the server administrator. The server administrator is responsible for installing and configuring FileMaker Server as well as managing the FileMaker Pro databases hosted on FileMaker Server.

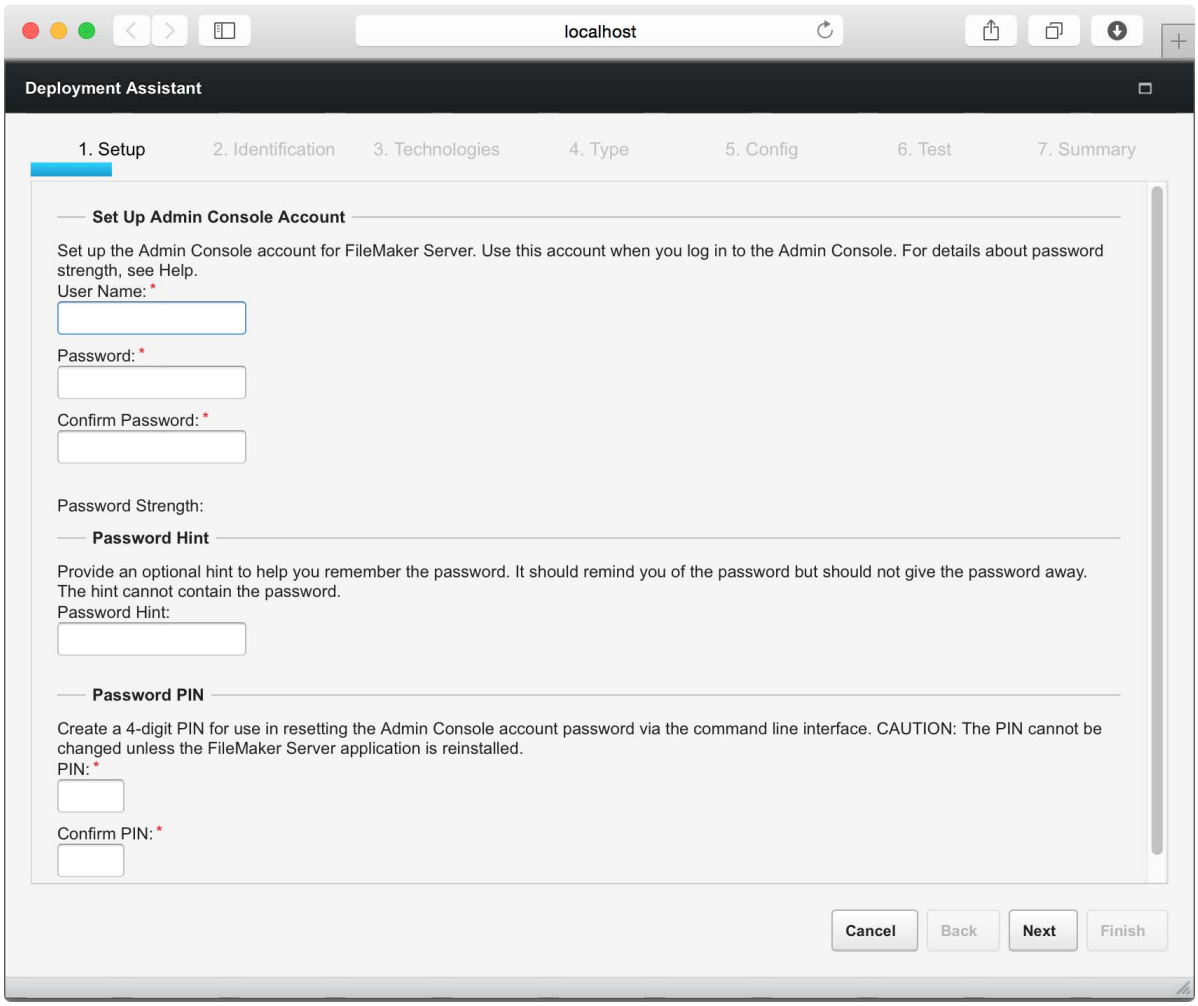
Note User names are not case-sensitive. Passwords are case-sensitive.

When you enter the password value, the Deployment assistant determines the strength of the password. FileMaker recommends that you enter a strong password.

Enter a password hint that will help you remember the password. The hint is displayed on the Admin Console Start Page after three failed attempts to enter the user name and password.

Enter a PIN value that can be used to reset the password using the command line interface (CLI).

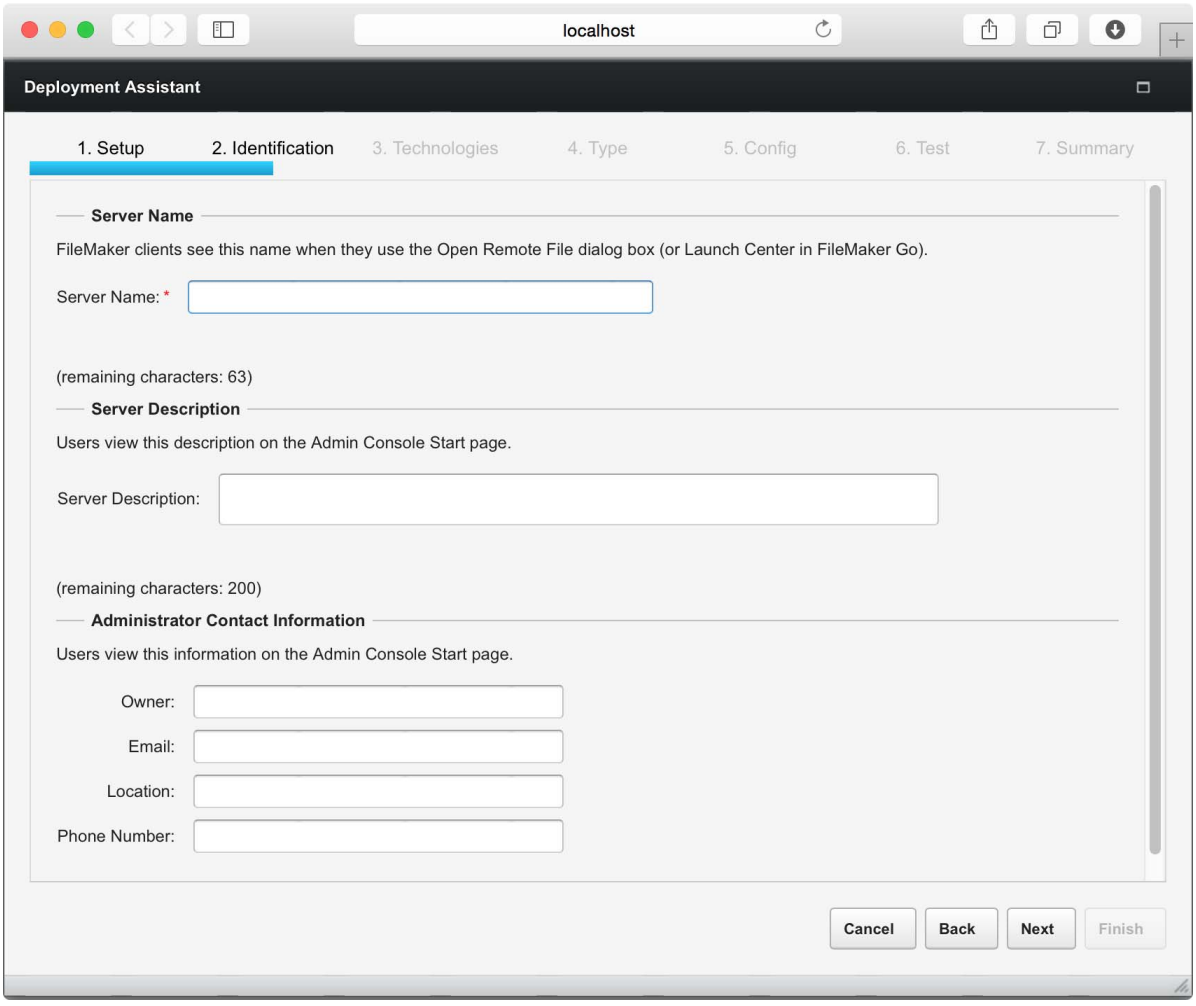
Click **Next**.



16. Specify a name, description, and contact information for this deployment of FileMaker Server. This information will appear on the FileMaker Server Admin Console Start Page. This information will also be included in the email when the FileMaker Server sends out warning or error notifications (see “Emailing notifications” on page 60).

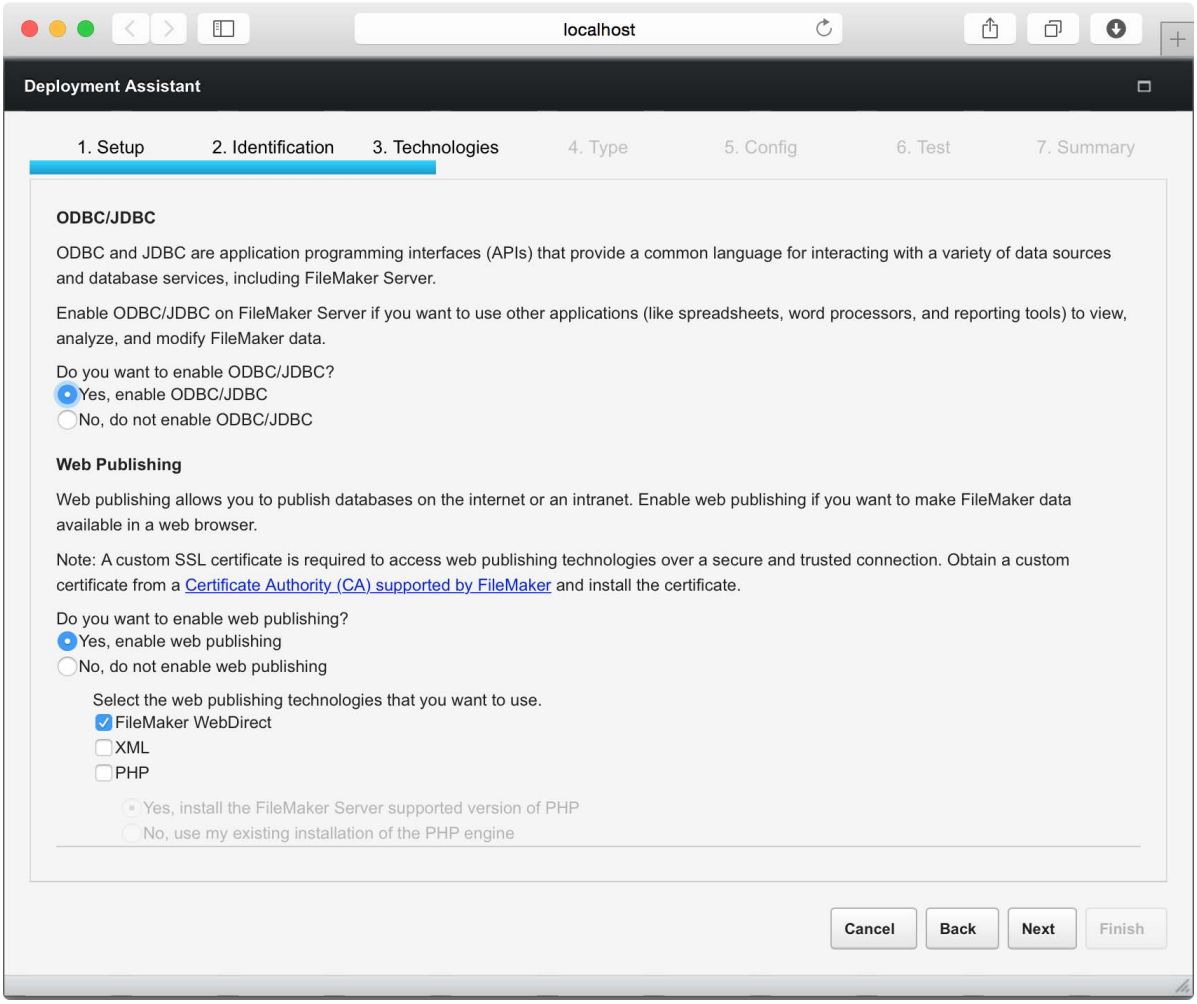
Server Name is displayed to FileMaker Pro users in the Launch Center window and to FileMaker Go users in the Launch Center.

Click **Next**.



17. You can enable a hosted FileMaker Pro file to be a data source via ODBC and JDBC. Click **Yes, enable ODBC/JDBC** or **No, do not enable ODBC/JDBC**.

Important This feature allows clients to use FileMaker files as data sources using ODBC and JDBC. This feature is not needed to host FileMaker Pro databases that access ODBC data sources. For more information, see FileMaker Pro Help.

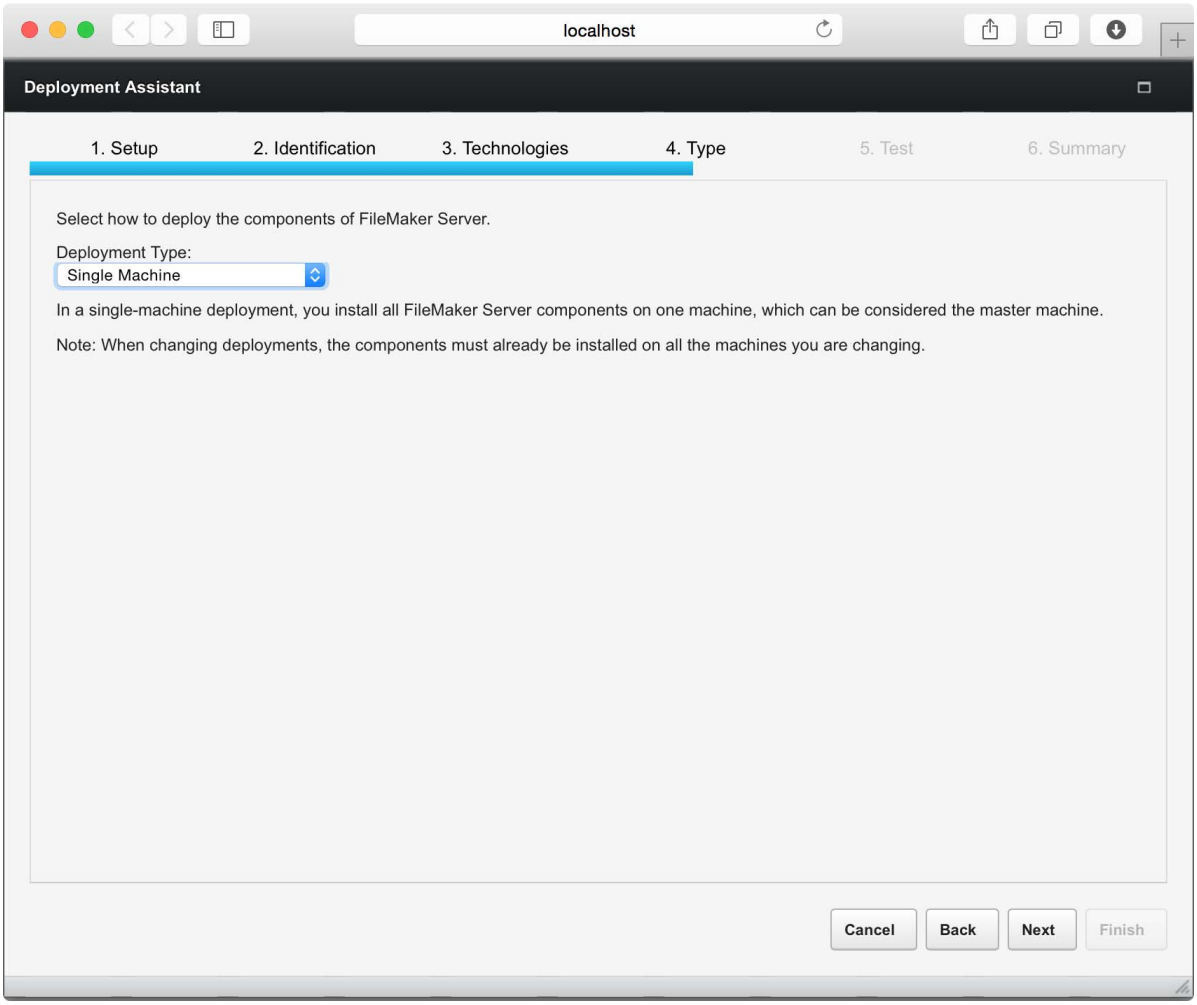


18. If you want to publish FileMaker data on the Internet or an intranet using FileMaker WebDirect or Custom Web Publishing, click **Yes, enable web publishing**. Otherwise, click **No, do not enable web publishing**. If you are not enabling web publishing, click **Next** and continue with step 20.

19. Select the web publishing technologies you want to use, and click **Next**.

- If you enable the XML and PHP web publishing technologies, FileMaker recommends that you use SSL for database connections with a custom SSL certificate installed.
- You can install the FileMaker Server supported version of the PHP engine (see http://www.filemaker.com/r/fms-specs), or you can use your own PHP engine. If you already have a PHP engine installed and choose to use the FileMaker Server supported PHP engine, your currently installed PHP engine will be disabled.
- If you use your own PHP engine, you must manually install the FileMaker API for PHP to use PHP publishing. See *FileMaker Server Custom Web Publishing Guide* for more information.

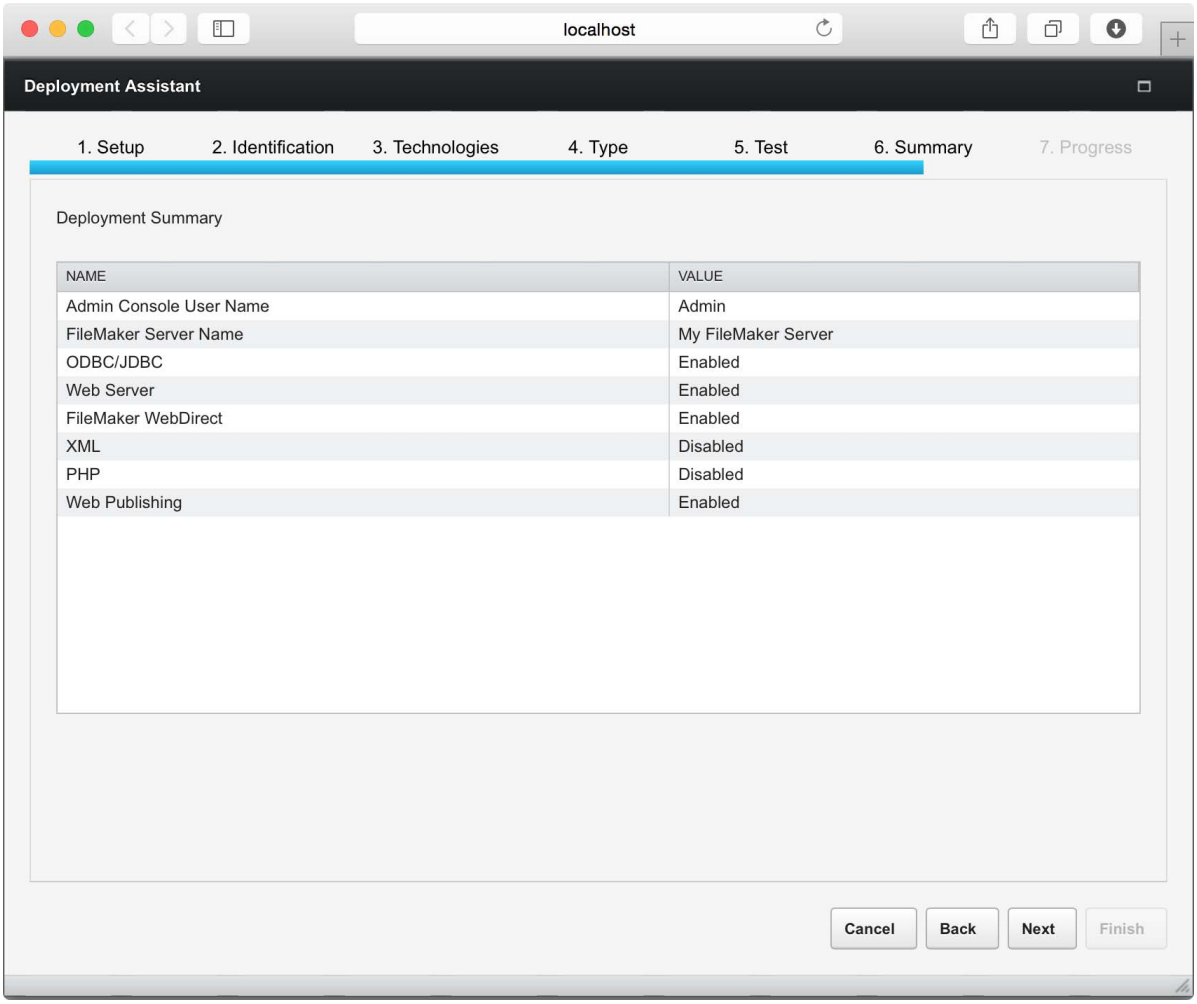
20. For a single-machine deployment, select **Single Machine**, then click **Next**.



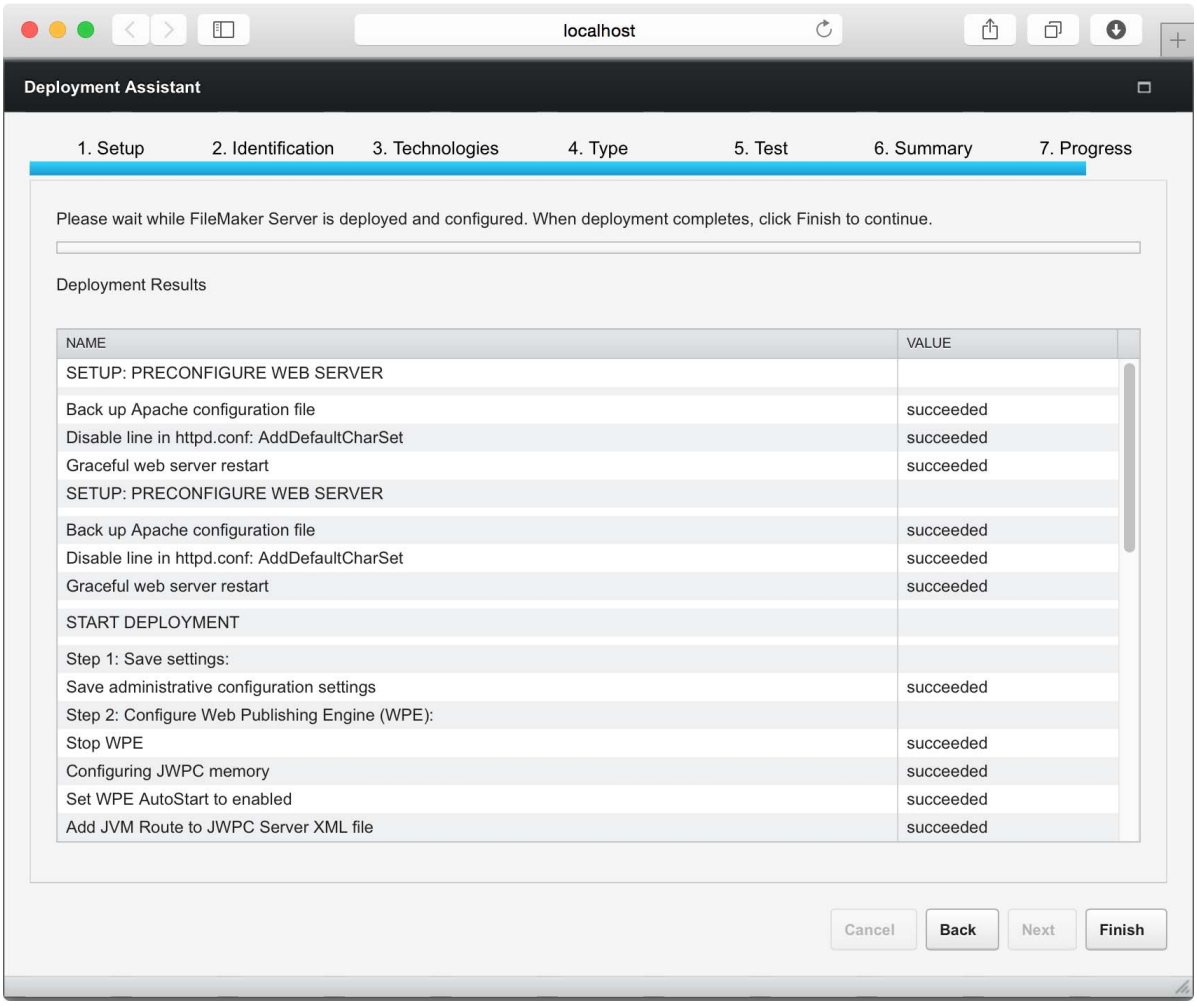
21. If web publishing is enabled and the Deployment assistant successfully communicates with the web server, you see **The web server test was successful**. Click **Next**.

If the Deployment assistant fails to communicate with the web server, see “Deployment assistant reports that the web server test failed” on page 47.

22. A deployment summary appears. Click **Next** or click **Back** to change any of your choices.



23. FileMaker Server is being deployed. This may take a few minutes. The information listed in **Deployment Results** shows the deployment and configuration changes as they occur. When deployment completes, click **Finish** to continue.

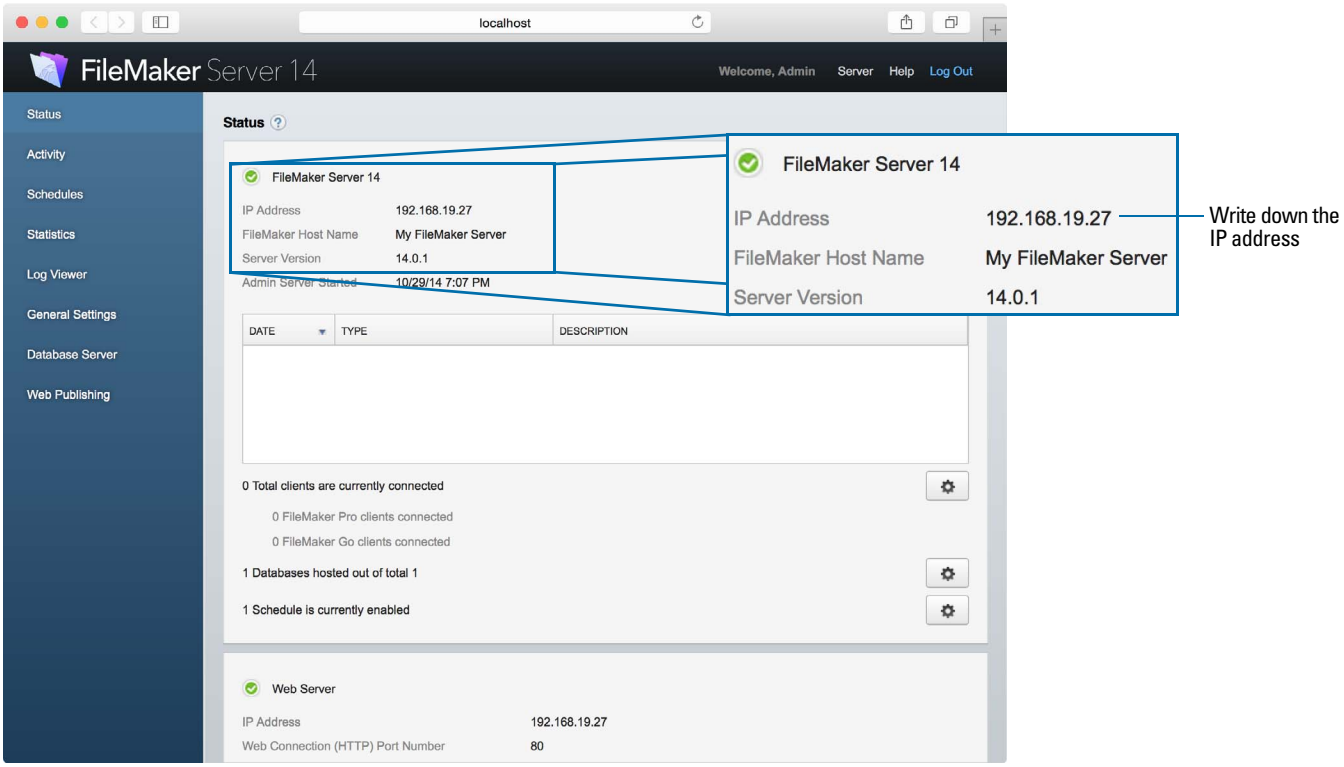


24. FileMaker Server Admin Console starts.

If you don't see FileMaker Server Admin Console, open a web browser and enter: `http://localhost:16001/admin-console`

25. In the FileMaker Server Status pane, note the IP address of the server.

Tip Write down the IP address so that you can start Admin Console from another computer, if needed.



Next steps

Now that you have deployed FileMaker Server, get started using your new software.

1. **Start Admin Console**: See "Starting Admin Console" on page 52.
2. **Test your installation**: FileMaker Server provides a sample database and a one-click method to verify that your installation is working. See chapter 4, "Testing your deployment."
3. **Register your software**: Register your copy of FileMaker Server. See "Customer support" on page 94.
4. **Administer FileMaker Server**: For information on how to upload databases, schedule backups, and other regular tasks, see chapter 5, "Administering FileMaker Server."

Chapter 3
Deploying FileMaker Server across multiple machines

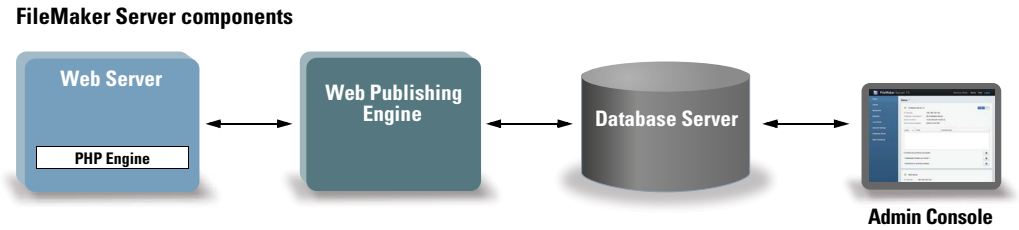
FileMaker Server allows you to deploy its components on multiple machines to improve overall performance. In many environments, a single-machine deployment provides sufficient performance for web publishing. However, if FileMaker Server will be used frequently by internet clients accessing data with FileMaker WebDirect, XML, or PHP, then you can deploy the components of FileMaker Server across two machines.

You can first deploy FileMaker Server on one machine. If the web publishing load increases, you can change your initial deployment to improve FileMaker Server's performance.

Note If you're not using web publishing, you don't gain performance improvements from a multiple-machine deployment.

Deployment alternatives

The diagram below shows the major components of FileMaker Server. You can deploy them all on one machine or across two machines. The operating systems of the machines can be all Windows, all OS X, or a combination of the two.



FileMaker Server uses the following components:

- **Web Server**: in Windows, FileMaker Server requires Internet Information Services (IIS), which will be enabled when you install FileMaker Server. In OS X, FileMaker Server uses its own instance of the Apache web server, so you do not need to enable the Apache instance that is installed as part of OS X.
- **Web Publishing Engine**: provides the Custom Web Publishing services and the FileMaker WebDirect services for databases hosted by FileMaker Server.
- **PHP Engine**: for Custom Web Publishing with PHP, FileMaker Server requires a PHP engine to respond to requests from the web server and to process PHP code. FileMaker Server includes a PHP engine and the FileMaker API for PHP. When PHP code calls the FileMaker API for PHP, those calls are interpreted and sent to the Web Publishing Engine.
- **Database Server**: hosts the databases that you share with FileMaker Pro and FileMaker Go users and publish on the web. In a multiple-machine deployment, the machine running the Database Server is called the *master* machine. See the description below.
- **Admin Console:** runs in a web browser on any client computer from which you want to configure and administer FileMaker Server.

When you deploy FileMaker Server across two machines, one machine is always the master and the other is a worker.

- The **master machine** is always the machine on which the Database Server is deployed.
- The **worker machine** is the machine that runs the Web Publishing Engine and the web server.

The master communicates with the worker to handle database requests from users, configure the settings on all machines, and monitor the status and activity of all components.

Important To enhance the security of your database solution, especially on the Internet, consider using a firewall on the public side of a FileMaker Server deployment. Also consider using SSL for the web server. For more information on setting up security for web published solutions, see http://www.filemaker.com/support.

The type of deployment you should use depends primarily on the web publishing load, as summarized in the table below. For a greater web publishing load, you may want to use two machines in your FileMaker Server deployment. You can first deploy on one machine and, if the load increases over time, you can change the deployment later to use two machines.

FileMaker Server use	Deployment type
FileMaker clients only	Single machine with Database Server only. No benefit from a two-machine deployment.
Solution development and testing	Single machine with or without Web Publishing Engine. No benefit from a two-machine deployment.
FileMaker clients and moderate web publishing	Single machine with Database Server and Web Publishing Engine. Provides good web publishing performance in most environments. You can expand to a two-machine deployment later, if web publishing load increases.
FileMaker clients and heavy web publishing load	Two machines. Deploy the Database Server on the master machine. Deploy the Web Publishing Engine and web server on a worker machine.

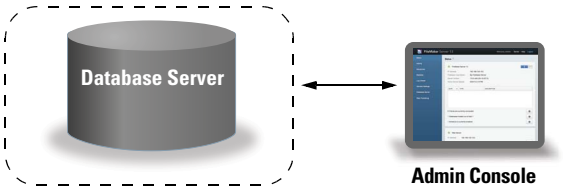
One-machine deployment

You can deploy FileMaker Server on one machine in two ways: Database Server only or Database Server and Web Publishing Engine. For information on installing FileMaker Server in a one-machine configuration, see chapter 2, “Installation quick start.”

Database Server only

You can install FileMaker Server on one machine with web publishing disabled. With this type of deployment, you can serve FileMaker Pro, FileMaker Go, and ODBC/JDBC clients but not FileMaker WebDirect or Custom Web Publishing clients.

Benefits: This is the easiest deployment to set up and administer if you don't need web publishing.



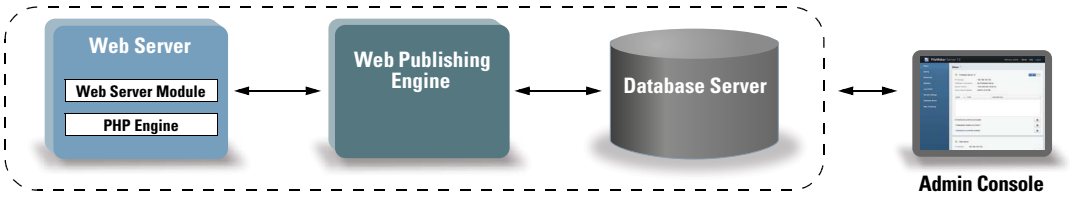
Ports 80 and 443 must be open (or alternative ports specified during installation).
Ports 5003 and 16000 must be open.
Port 2399 must be open to support ODBC and JDBC clients.
Ports 1895, 5013, 16001, 50003, and 50004 must be available.

Note Even when web publishing is disabled, FileMaker Server requires a web server to host the web-based Admin Console application and to handle some data transfer tasks.

Database Server and Web Publishing Engine

You can install Database Server, the Web Publishing Engine, and all of the associated software components on the same machine as the web server.

Benefits: This is the simplest deployment with web publishing and the one that most FileMaker Server users will use. This configuration is suitable for small deployments (up to 50 FileMaker Pro and FileMaker Go clients combined) and limited web publishing.

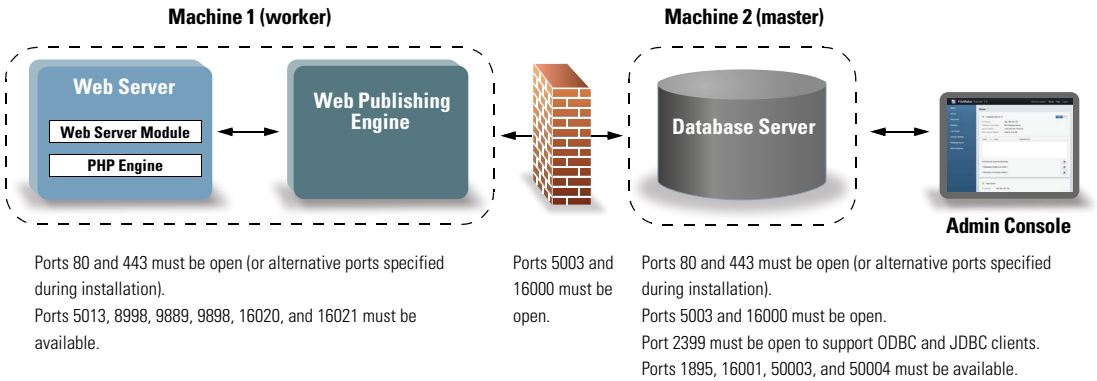


Ports 80 and 443 must be open (or alternative ports specified during installation).
Ports 5003 and 16000 must be open.
Port 2399 must be open to support ODBC and JDBC clients.
Ports 1895, 5013, 8998, 9889, 9898, 16001, 16020, 16021, 50003, and 50004 must be available.

Two-machine deployment

You can deploy FileMaker Server across two machines: the Web Publishing Engine, web server, and Web Server Module on one machine and the Database Server on a second machine.

Benefits: This deployment separates all of the web publishing-related components from the Database Server. Under most conditions, this configuration is the highest performing FileMaker Server deployment.



Note In addition to the web server on the worker machine used for web publishing, FileMaker Server also requires a web server on the master machine to host the web-based Admin Console application and to handle some data transfer tasks.

Installing on multiple machines

For a multiple-machine deployment, you install FileMaker Server software on each machine. After the software is installed on all of the machines, you use the Deployment assistant on the master machine to configure your settings and specify which machine is the worker. You do not use the Deployment assistant on a worker machine.

Important Install the FileMaker Server software first on the worker machine and then on the master machine.

Before you begin installing on multiple machines

Do the following before installing FileMaker Server on multiple machines:

- Ensure that no existing websites on the master or worker machines use port 80 or 443, or be prepared to enter alternative ports. These ports are used by FileMaker Server on both machines. If the FileMaker Server installer detects an existing website using these ports, the installer prompts you to let it disable that website or to specify alternative ports.
  - **Windows:** The FileMaker Server installer runs the Microsoft Application Request Routing (ARR) installer (which enables the IIS web server, if it isn't already enabled), creates its own website in IIS, and configures the website to use the ports specified for web connections.
  - **OS X:** The web server included in OS X does not need to be enabled; if it is enabled, ensure that no existing website uses port 80 or 443, or be prepared to specify alternative ports during installation. The installer creates a separate web server instance and enables it for FileMaker Server to use on these ports.

  For more information on the web server, see chapter 7, "Setting up the web server."

- When you're running FileMaker Server in an environment that uses a firewall, be sure to configure the firewall on each machine to allow FileMaker Server to use ports as indicated in "Ports used by FileMaker Server" below. Restart each machine after configuring the firewall.
- To upgrade from an earlier version of FileMaker Server, see chapter 6, "Upgrading or moving an existing installation."
- If you already have a single-machine deployment of FileMaker Server 14, you can add a second machine to your existing deployment. To add a second machine, install FileMaker Server on the second machine as a worker (see "Installing on the worker machine" on page 28). Then in Admin Console on your existing master machine, change the deployment to two machines. For more information on editing an existing deployment, see FileMaker Server Help.
- Locate your license key. See "About the license key" on page 7.
- If you are currently running FileMaker Pro on the same machine, you must quit FileMaker Pro before installing FileMaker Server.

Also keep in mind the following:

- If the machine has anti-virus software installed, you may need to disable or uninstall it before running the FileMaker Server installer. Don't enable anti-virus software again until after the Deployment assistant has finished.

  Do not allow anti-virus software to scan the folders that contain hosted database files or the folders that contain files for container fields that store data externally.
- You cannot run two different versions of FileMaker Server on the same machine at the same time.
- Because some DHCP servers cycle IP addresses, FileMaker recommends using a static IP address.
- **OS X:** Avoid using the OS X Server application to enable any HTTP services while running FileMaker Server. HTTP services provided by OS X Server may interfere with FileMaker Server. See "Using the Apache web server in OS X" on page 76.

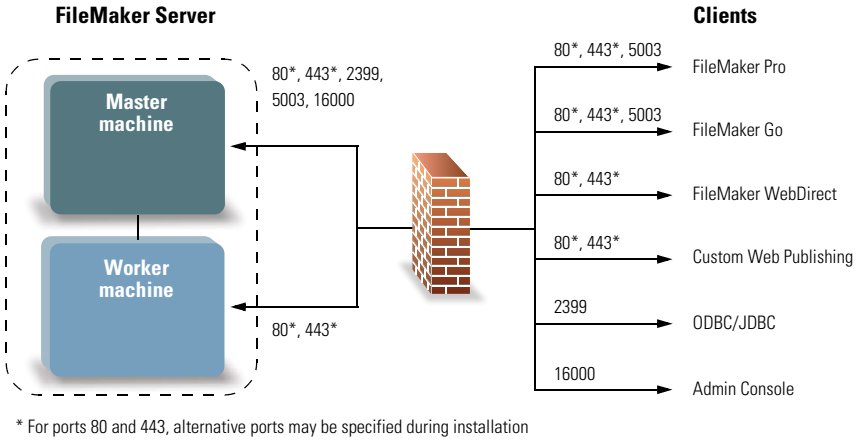
Ports used by FileMaker Server

Note that not all of the ports listed below need to be open to end users or between all machines in a FileMaker Server deployment. The ports marked "Open" must be open in firewalls between the machines or end users indicated in the "Used by" column. Ports marked "Available" are used locally by FileMaker Server on the machine indicated in the "Used by" column; these ports must not be used for anything else but do not need to be opened in a firewall.

Port number	Used by	Open / Available	Purpose
80, or alternative port specified during installation	Web server machine, end users	Open	HTTP
80, or alternative port specified during installation	Master machine, end users, and Admin Console users	Open	Progressive downloading of container data to all clients, redirects to port 16000 for Admin Console
443, or alternative port specified during installation	Web server machine, end users	Open	HTTPS

Port number	Used by	Open / Available	Purpose
443, or alternative port specified during installation	Master machine, end users	Open	HTTPS: Uploading databases from FileMaker Pro, inserting data in externally stored container fields from all clients
1895	Master machine (local only)	Available	FileMaker internal
2399	Master machine, end users	Open	ODBC and JDBC sharing. Port 2399 only needs to be open to support ODBC and JDBC clients.
5003	Master machine, end users	Open	Hosting databases for FileMaker Pro and FileMaker Go clients
5013	Worker machine	Available	FileMaker internal
5015	Web Publishing Engine machine	Available	FileMaker internal
8998	Web Publishing Engine machine	Available	FileMaker internal
9889	Web Publishing Engine machine	Available	FileMaker internal
9898	Web Publishing Engine machine	Available	FileMaker internal
16000	Master machine, Admin Console users	Open	HTTPS: Admin Console Start Page, Admin Helpers
16000	Worker machine	Open	Admin Helpers
16001	Master machine (local only)	Available	FileMaker internal
16001	Worker machine (local only)	Available	FileMaker internal
16020	Web Publishing Engine machine	Available	FileMaker internal
16021	Web Publishing Engine machine	Available	FileMaker internal
50003	Master machine (local only)	Available	FileMaker Server service (Windows) or background process (OS X)
50004	Master machine	Available	FileMaker Script Engine

The following illustration shows the ports that must be open in a firewall in order for FileMaker clients and Admin Console to communicate with FileMaker Server.



Ports that must be open to support client connections

Installing on the worker machine

Install FileMaker Server on the worker machine first, then on the master machine. A worker machine runs the Web Publishing Engine and the web server that serves web publishing clients.

Note If you set up a machine as a worker and want to change it to a master, uninstall and then reinstall FileMaker Server. Choose **Master** in the installer's Master/Worker Designation dialog box. For more information, see chapter 6, "Upgrading or moving an existing installation."

1. Insert the DVD into the drive or follow your electronic download instructions.
2. Double-click the installation icon.

FileMaker Server 14 (OS X) **Setup (Windows)**

- **Windows:** If a User Account Control alert appears, click **Yes**.
- **OS X:** Enter your OS X user name and password, then skip to step 5.

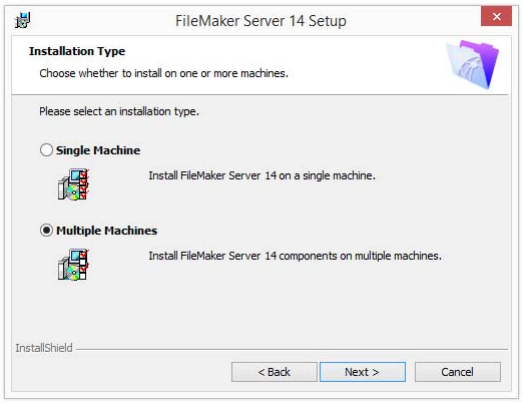
3. **Windows:** Select a language, then click **OK**.
4. **Windows:** To begin installation, click **Next**.
5. Read the Before You Begin information. If there is a task you did not do, quit the installer and do the task. If you are ready to install FileMaker Server, click **Next** (Windows) or **Continue** (OS X).
6. Review and accept the end user license agreement.

   OS X: You may need to enter your OS X user name and password again.

7. **Windows:** Select a destination folder, then click **Next**.

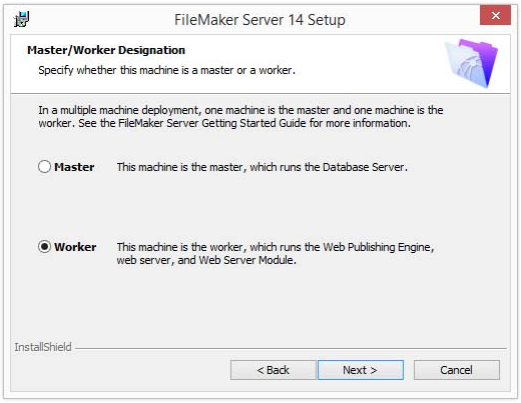
   Note In Windows, you can select a non-default location. See “Installation notes” on page 43.

8. Select **Multiple Machines** and click **Next**.



9. Select **Worker**.

   Windows: Click **Next**.



10. Specify the ports that FileMaker Server should use for web connections and secure web connections, then click **Next**.

    If the installer detects that the ports required for the web server are currently in use, the installer prompts you to let it disable the website currently using those ports. To continue installation, you must click **Disable Websites**. Or you can click **Cancel**, disable the website manually, then run the installer again.

    Note The port numbers you specify for the worker machine must also be specified on the master machine.

11. Click **Install**.

- **Windows:**

  If you do not have the Microsoft Visual C++ 2013 Redistributable Package (x64) or a minimum update of Java Runtime Environment version 8, the FileMaker Server installer automatically installs them.

  If you do not have Bonjour for Windows installed, you are prompted to allow the FileMaker Server installer to install it. Follow the onscreen instructions.

  If you do not have the Microsoft Application Request Routing (ARR) extension for IIS installed, the FileMaker Server installer downloads and installs it. If your machine cannot access the Internet, you need to download and install this extension manually before the installer can continue. If IIS is not enabled, the ARR installer will enable it.

  For more information, see “Installation notes” on page 43.

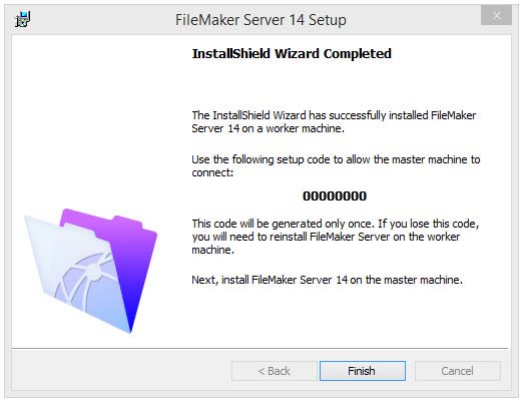
- **OS X:**

  If you do not have a minimum update of Java Runtime Environment version 8 installed, you are prompted to allow the FileMaker Server installer to install it. If Bonjour is not running, you are prompted to run it.

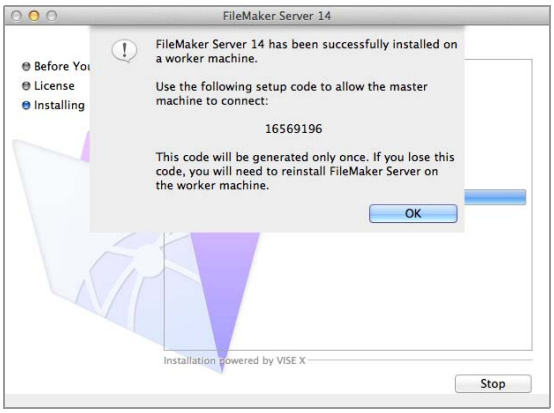
  For more information about Java and Bonjour installation, see “Installation notes” on page 43.

FileMaker Server begins to install. This process may take several minutes.

12. After the software has been successfully installed, FileMaker Server displays a setup code that you will use to allow the master machine to connect to the worker machine. Make a note of this setup code. You will use it during the installation of the master machine.



Windows



OS X

13. Click **Finish** (Windows) or **OK** (OS X) to complete the installation of the worker machine.

14. Install FileMaker Server 14 on the master machine as described in the next section.

Installing on the master machine

Install FileMaker Server first on the worker machine (see “Installing on the worker machine” on page 28), then on the master machine. The master machine always runs the Database Server and the web server that hosts Admin Console.

1. Insert the DVD into the drive or follow your electronic download instructions.
2. Double-click the installation icon.

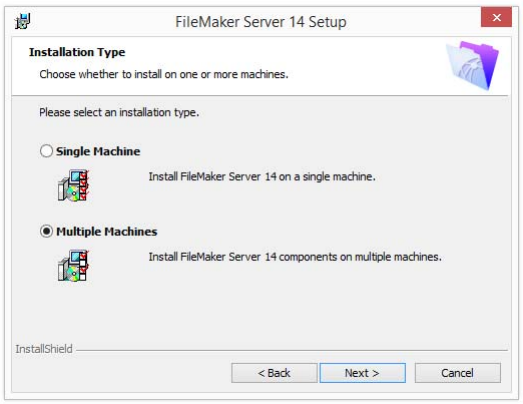
FileMaker Server 14 (OS X)

Setup (Windows)

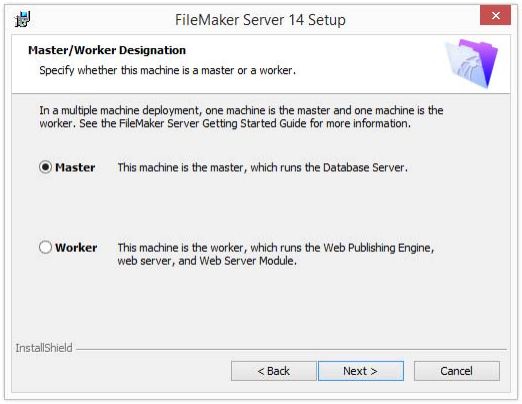
   - **Windows:** If a User Account Control alert appears, click **Yes**.
   - **OS X:** Enter your OS X user name and password, then skip to step 5.
3. **Windows:** Select a language, then click **OK**.
4. **Windows:** To begin installation, click **Next**.
5. Read the Before You Begin information. If there is a task you did not do, quit the installer and do the task. If you are ready to install FileMaker Server, click **Next** (Windows) or **Continue** (OS X).
6. Review and accept the end user license agreement.

   OS X: You may need to enter your OS X user name and password again.
7. **Windows:** Select a destination folder, then click **Next**.

   Note In Windows, you can select a non-default location. See “Installation notes” on page 43.
8. Select **Multiple Machines** and click **Next**.



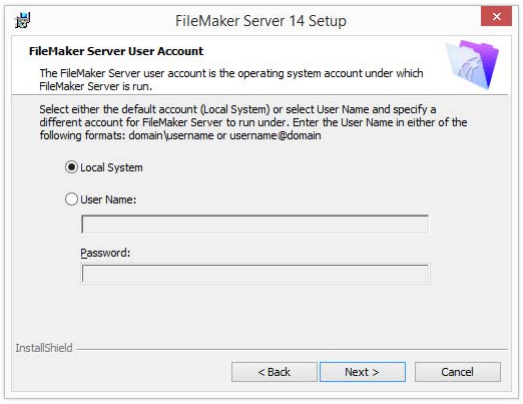
9. Select **Master** and click **Next**.



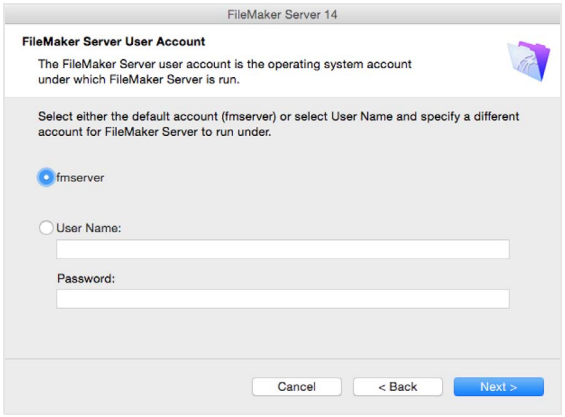
10. Choose one of the following options for the FileMaker Server user account (the account under which you want to run FileMaker Server):

- To use the default account, select **Local System** (Windows) or **fmserver** (OS X), then click **Next**.
- To use an existing account on this machine, select **User Name**, enter the account's user name and password, then click **Next**. You may want to choose this option if you already have an account that has privileges set as you want—for example, to access network-attached storage.

  If the existing user account you specified does not have sufficient privileges for FileMaker Server to run, the installer displays an error message. For more information, see "Installation notes" on page 43.



Windows



OS X

11. Enter your license key information.

12. Windows: Click **Next**.

13. Specify the ports that FileMaker Server should use for web connections and secure web connections, then click **Next**.

    If the installer detects that the ports required for the web server are currently in use, the installer prompts you to let it disable the website currently using those ports. To continue installation, you must click **Disable Websites**. Or you can click **Cancel**, disable the website manually, then run the installer again.

    Note The port numbers you specify for the master machine must match the port numbers that you specified for the worker machine.

14. Click **Install**.

    - **Windows:**

      If you do not have the Microsoft Visual C++ 2013 Redistributable Package (x64) or a minimum update of Java Runtime Environment version 8, the FileMaker Server installer automatically installs them.

      If you do not have Bonjour for Windows installed, you are prompted to allow the FileMaker Server installer to install it. Follow the onscreen instructions.

      If you do not have the Microsoft Application Request Routing (ARR) extension for IIS installed, the FileMaker Server installer downloads and installs it. If your machine cannot access the Internet, you need to download and install this extension manually before the installer can continue. If IIS is not enabled, the ARR installer will enable it.

      For more information, see “Installation notes” on page 43.

    - **OS X:**

      If you do not have a minimum update of Java Runtime Environment version 8 installed, you are prompted to allow the FileMaker Server installer to install it. If Bonjour is not running, you are prompted to run it.

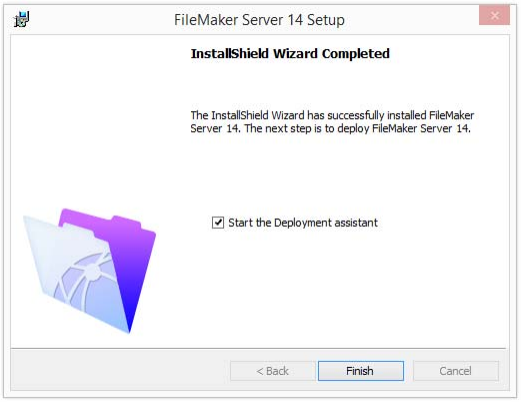
      For more information about Java and Bonjour installation, see “Installation notes” on page 43.

    FileMaker Server begins to install. This process may take several minutes.

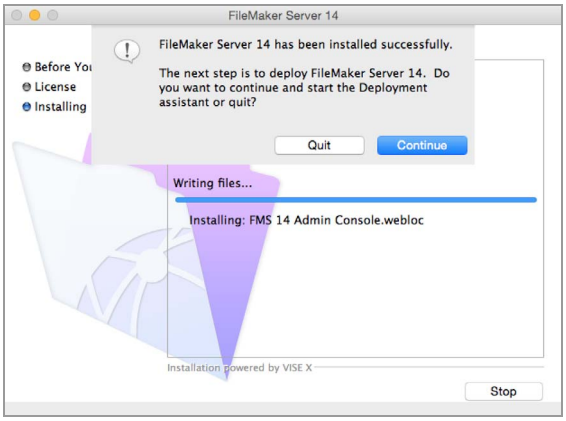
15. After the software has been successfully installed, start the Deployment assistant.

- **Windows:** In the last step of the installer, select **Start the Deployment assistant**, then click **Finish**.
- **OS X:** Click **Continue**.

If necessary, see “Deployment assistant doesn’t start after installation” on page 47.



Windows



OS X

If you want, you can stop now and start the Deployment assistant later. To deploy FileMaker Server at a later time:

- **Windows 8, Windows Server 2012 R2:** On the Windows Start screen, click **FMS 14 Admin Console**.
- **Windows Server 2008 R2:** Click the **Start** button > **All Programs** > **FileMaker Server** > **FMS 14 Admin Console**.
- **OS X:** Double-click the **FMS 14 Admin Console** shortcut on the desktop.

The Deployment assistant opens in the web browser. It may take a few minutes for Admin Console to start and the Deployment assistant to appear.

Note If Admin Console and Deployment assistant do not start, see “Deployment assistant doesn’t start after installation” on page 47.

16. In the first step of the Deployment assistant, assign the user name and password you want to use whenever you log in to Admin Console as the server administrator. The server administrator is responsible for installing and configuring FileMaker Server as well as managing the FileMaker Pro databases hosted on FileMaker Server.

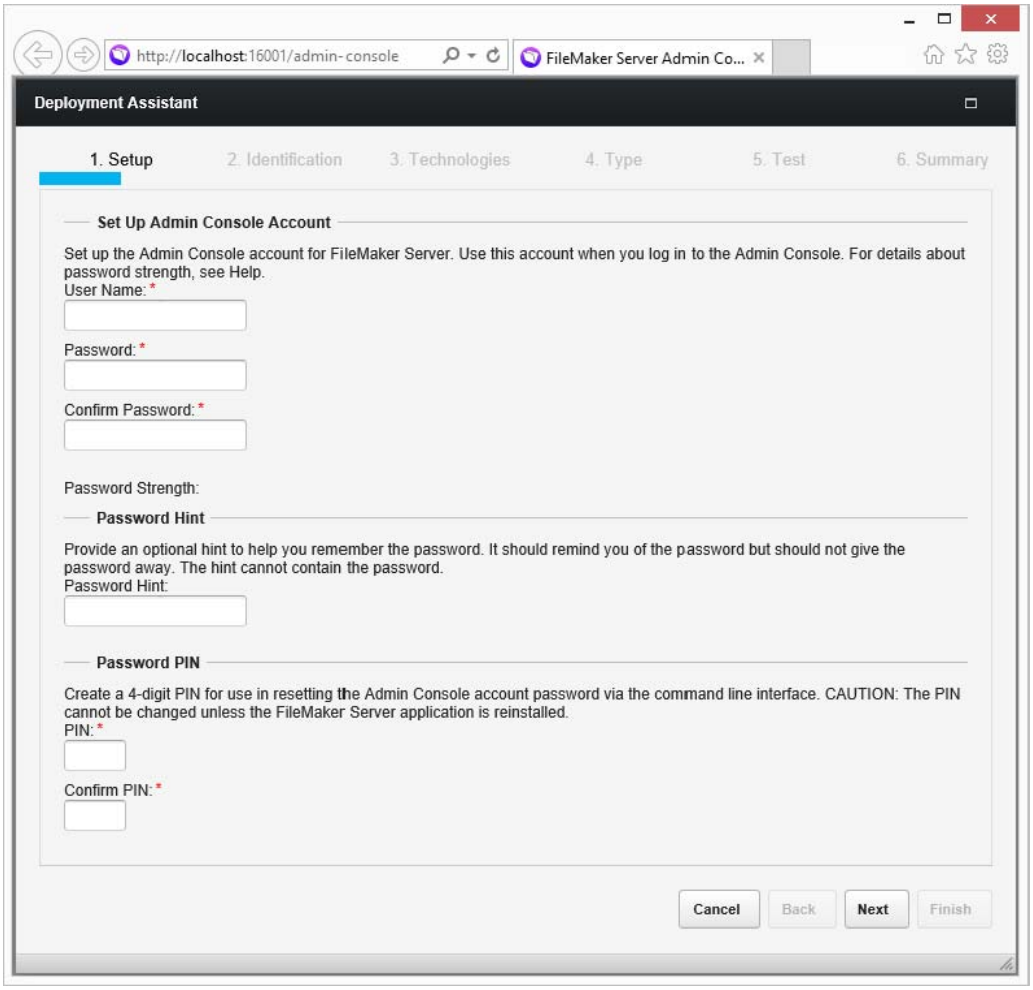
Note User names are not case-sensitive. Passwords are case-sensitive.

When you enter the password value, the Deployment assistant determines the strength of the password. FileMaker recommends that you enter a strong password.

Enter a password hint that will help you remember the password. The hint is displayed on the Admin Console Start Page after three failed attempts to enter the user name and password.

Enter a PIN value that can be used to reset the password using the command line interface (CLI).

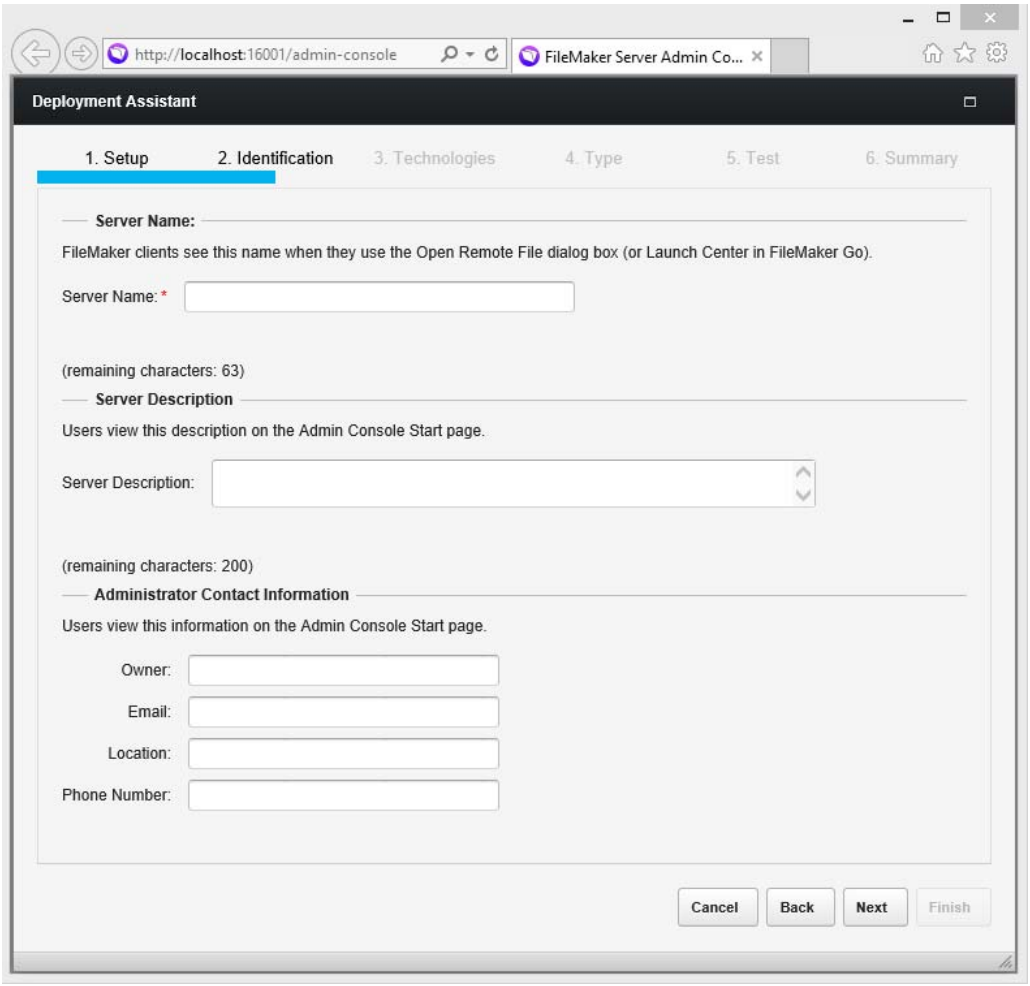
Click **Next**.



17. Specify a name, description, and contact information for this deployment of FileMaker Server. This information will appear on FileMaker Server Admin Console Start Page. This information will also be included in the email when the FileMaker Server sends out warning or error notifications (see “Emailing notifications” on page 60).

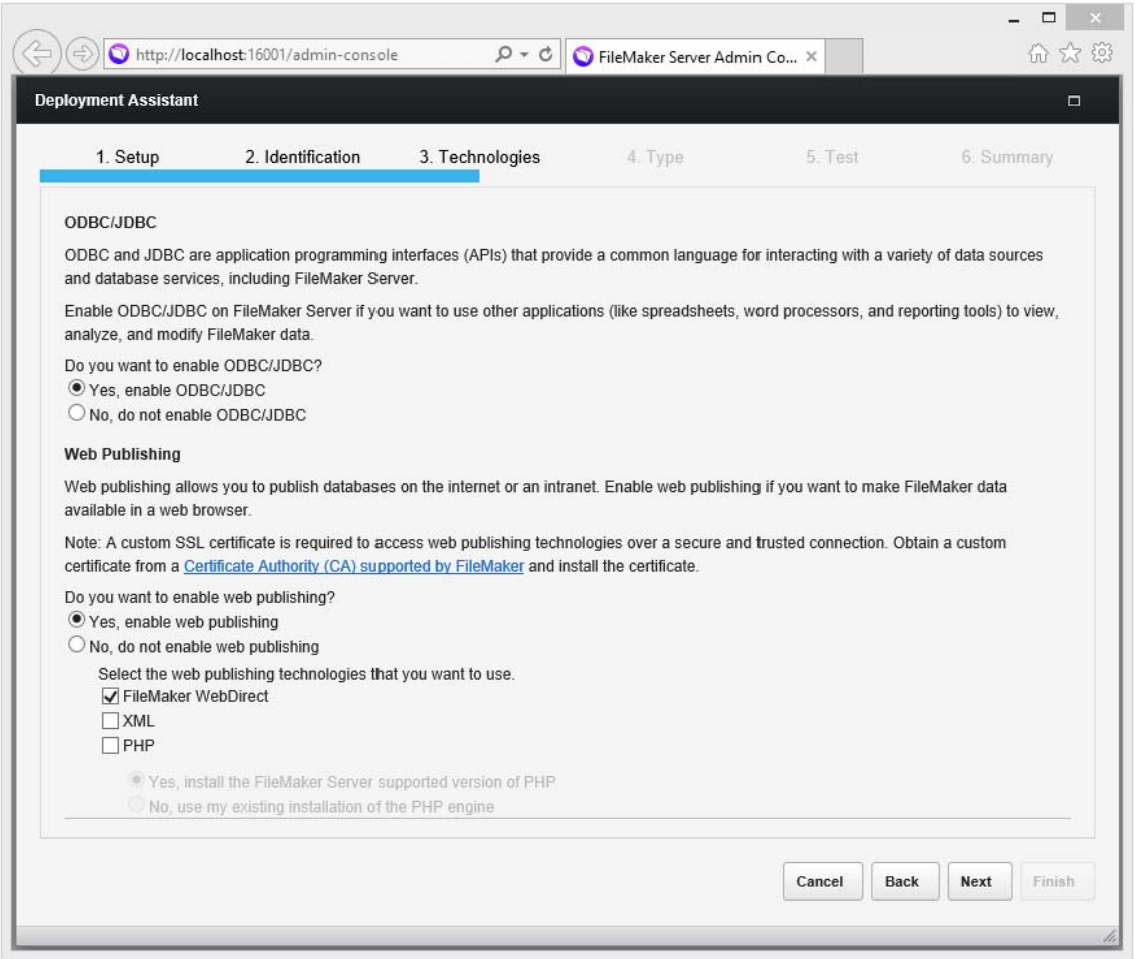
Server Name is displayed to FileMaker Pro users in the Launch Center window and to FileMaker Go users in the Launch Center.

Click **Next**.



18. You can enable a hosted FileMaker Pro file to be a data source via ODBC and JDBC. Click **Yes, enable ODBC/JDBC** or **No, do not enable ODBC/JDBC**.

Important This feature allows clients to use FileMaker files as data sources using ODBC and JDBC. This feature is not needed to host FileMaker Pro databases that access ODBC data sources. For more information, see FileMaker Pro Help.

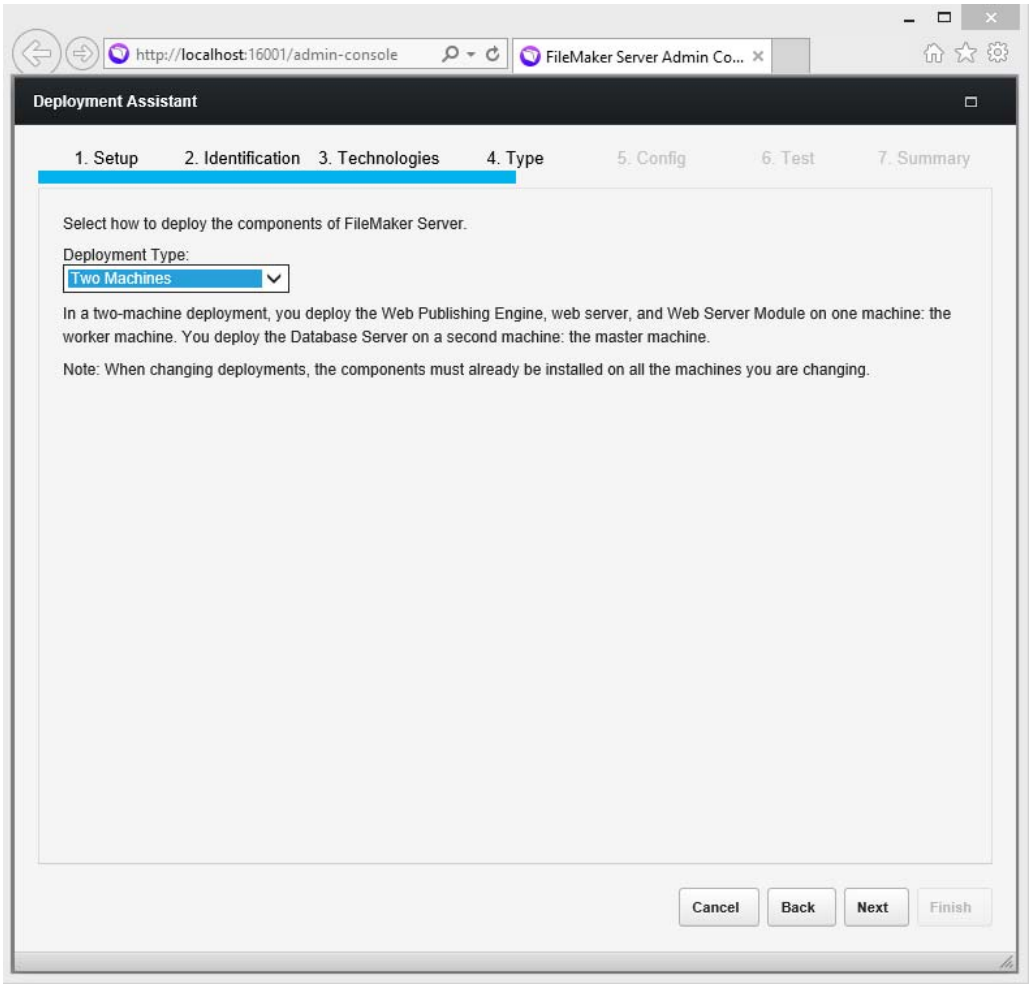


19. To publish FileMaker data on the Internet or an intranet using FileMaker WebDirect or Custom Web Publishing, click **Yes, enable web publishing**.

20. Select the web publishing technologies you want to use, and click **Next**.

- If you enable the XML and PHP web publishing technologies, FileMaker recommends that you use SSL for database connections with a custom SSL certificate installed.
- You can install the FileMaker Server supported version of the PHP engine (see http://www.filemaker.com/r/fms-specs), or you can use your own PHP engine. If you already have a PHP engine installed and choose to use the FileMaker Server supported PHP engine, your currently installed PHP engine will be disabled.
- If you use your own PHP engine, you must manually install the FileMaker API for PHP to use PHP publishing. See *FileMaker Server Custom Web Publishing Guide* for more information.

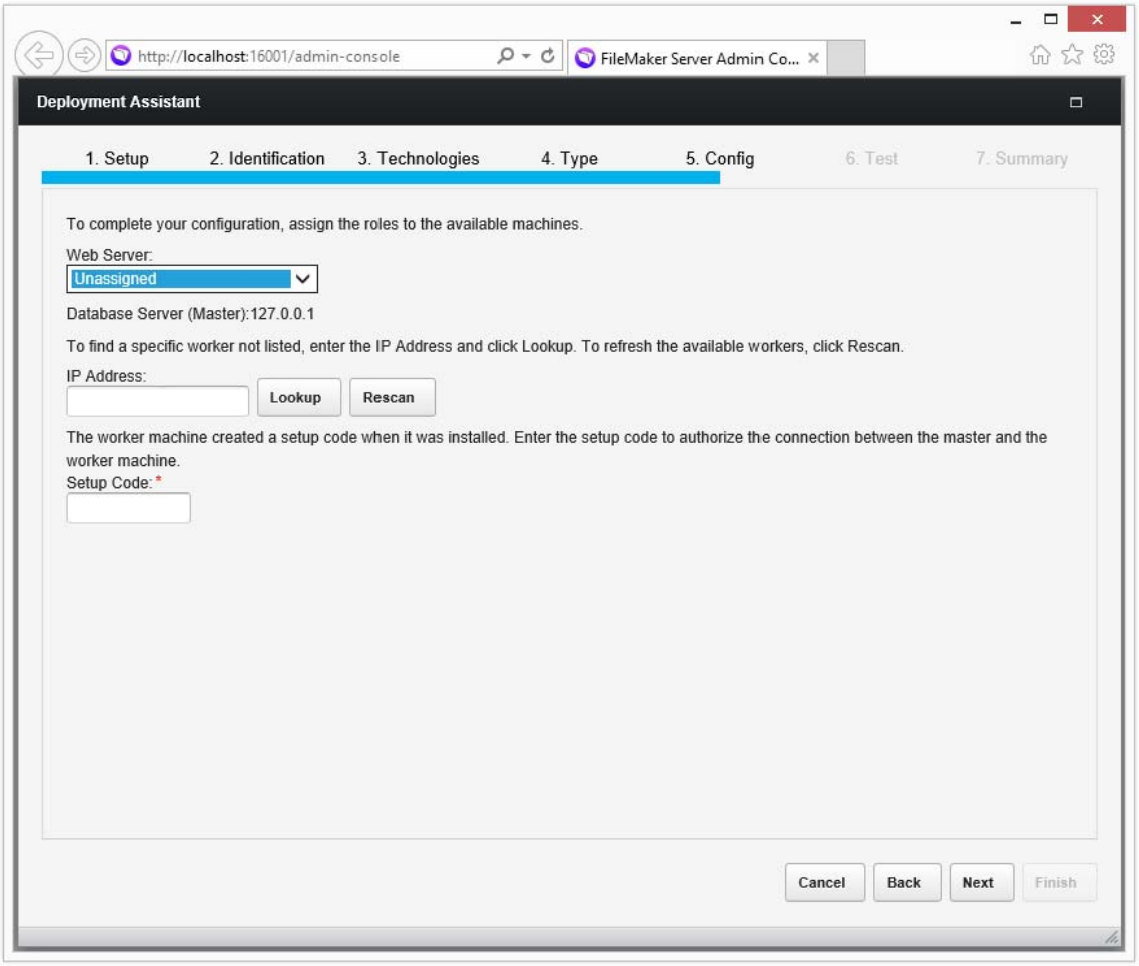
21. For a two-machine deployment, select **Two Machines**. Click **Next**. For more information, see “Deployment alternatives” on page 22.



22. Assign a worker machine to the web server role. Click **Next**.

- The Deployment assistant detects all unassigned worker machines on the local network and shows their IP addresses in the **Web Server** list. If the worker is not listed, click **Rescan**. Then check to see whether the worker is listed.
- If the worker's IP address is still not listed, enter the address in **IP Address** and click **Lookup**. The IP address you entered is added to the **Web Server** list if the machine responds and is an available worker.
- For **Setup Code**, enter the setup code that FileMaker Server displayed on the worker machine after the software was successfully installed.

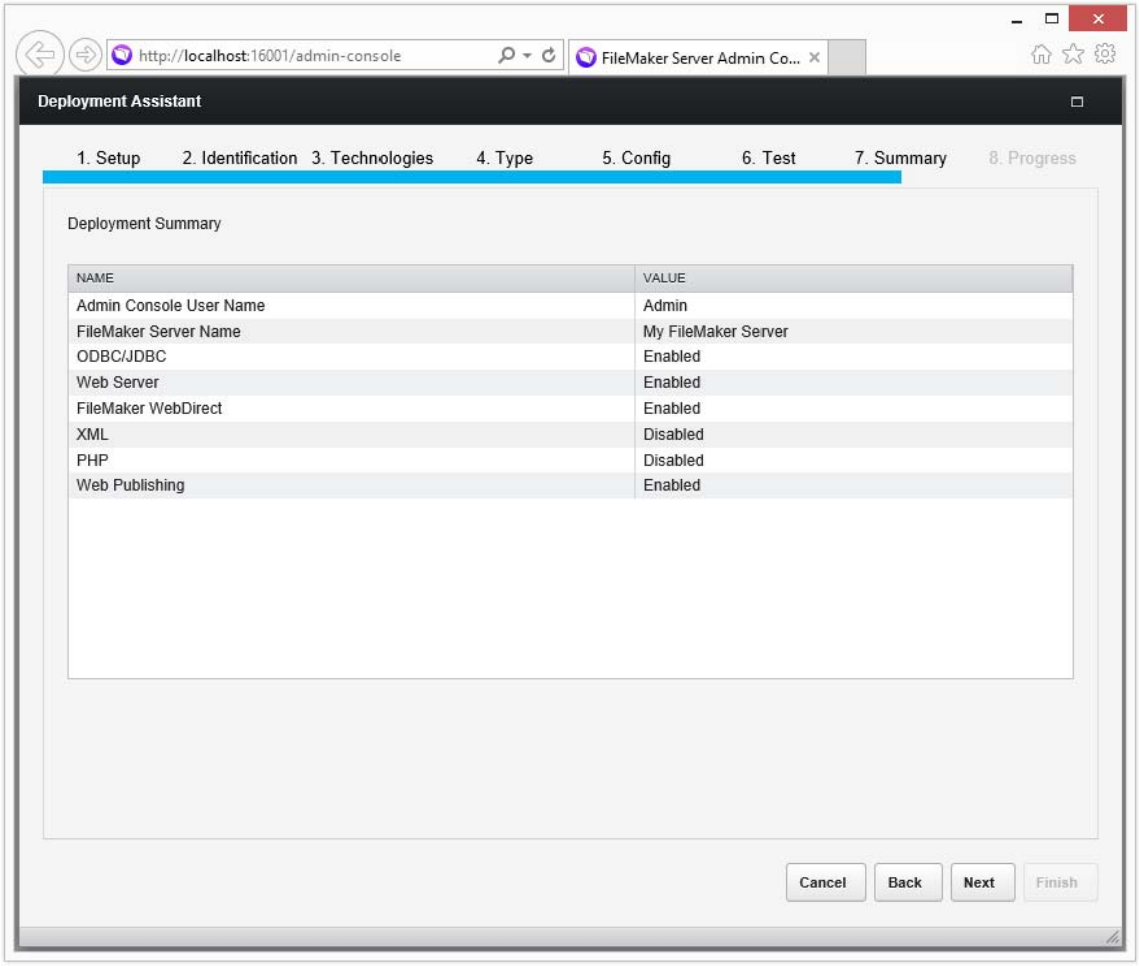
Note You will not be able to see the worker machine if the required ports of the firewall are not open. See “Before you begin installing on multiple machines” on page 25.



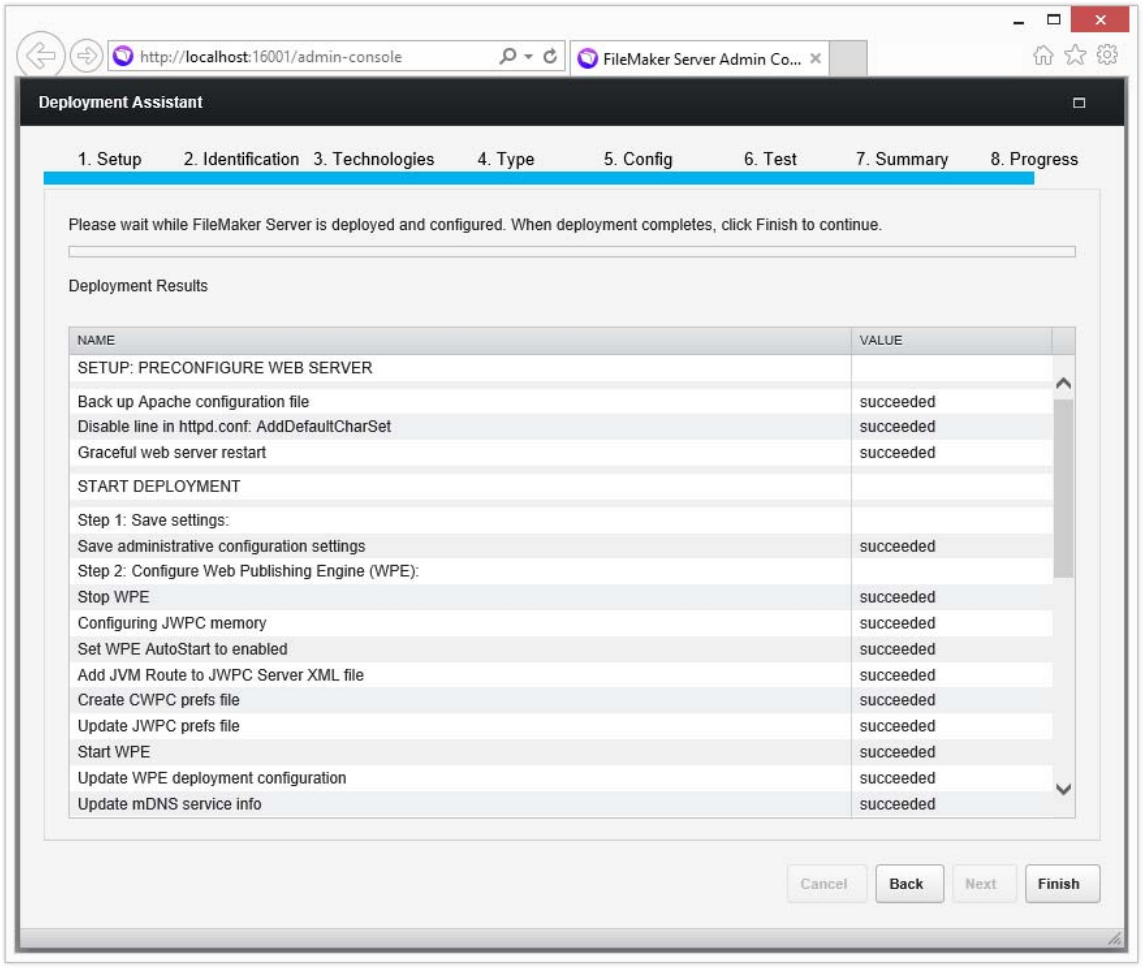
23. If the Deployment assistant successfully communicates with the web server, you see **The web server test was successful**. Click **Next**.

If the Deployment assistant fails to communicate with the web server, see “Deployment assistant reports that the web server test failed” on page 47.

24. A deployment summary appears. Click **Next** or click **Back** to change any of your choices.



25. FileMaker Server is being deployed. This may take a few minutes. The information listed in **Deployment Results** shows the deployment and configuration changes as they occur. When deployment completes, click **Finish** to continue.

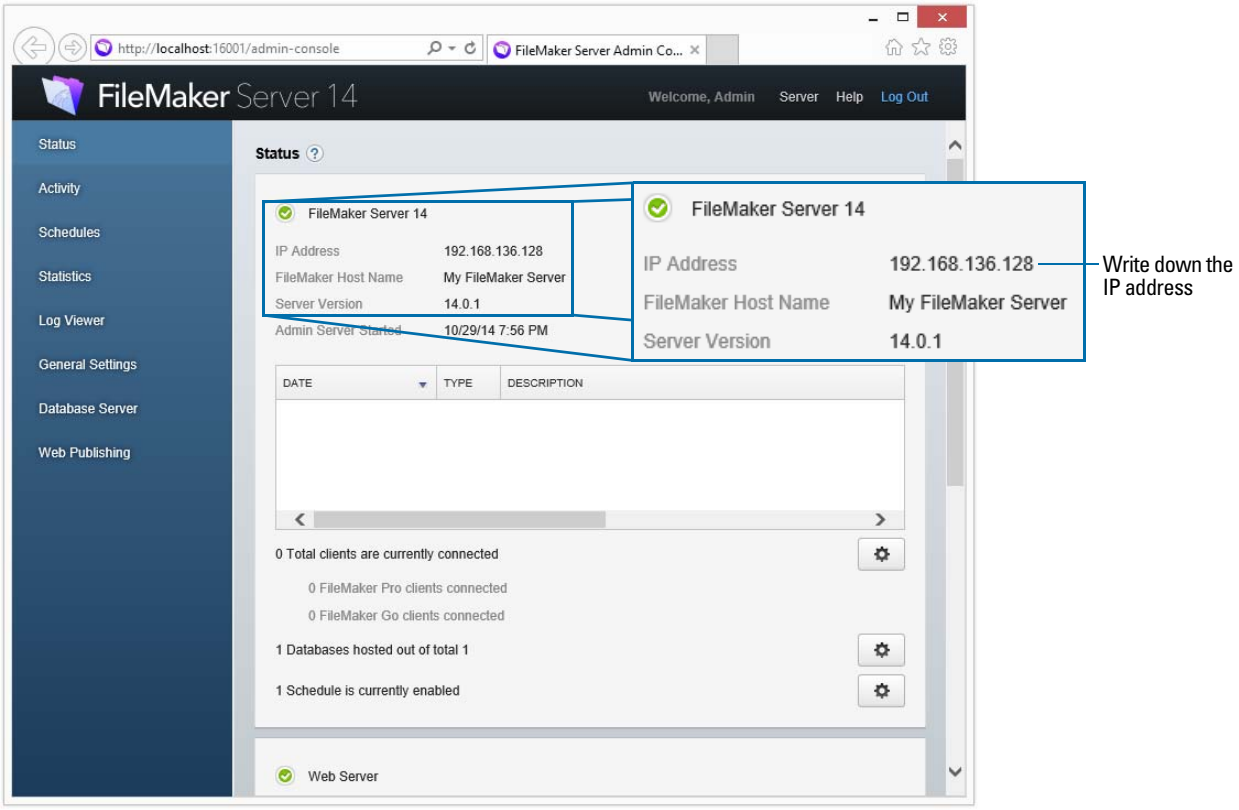


26. FileMaker Server Admin Console starts.

If you don't see FileMaker Server Admin Console, open a web browser and enter:
`http://localhost:16001/admin-console`

27. In the FileMaker Server Status pane, note the IP address of the server.

Tip Write down the IP address so that you can start Admin Console from another computer, if needed.



Installation notes

For information on the versions of supporting software that are required, see http://www.filemaker.com/r/fms-specs.

- **Windows:** You can install FileMaker Server in a non-default location including a non-boot volume, but not on remote network drives or external removable drives. The path you specify replaces the beginning of the default installation path, \Program Files\FileMaker\FileMaker Server. For example, if you specify the My_Path installation folder, the Databases, Scripts, and Extensions folders are installed as follows:
  - \My_Path\Data\Databases
  - \My_Path\Data\Scripts
  - \My_Path\Database Server\Extensions
- **OS X:** Do not install FileMaker Server on a target volume that is formatted as a Mac OS Extended (Journaled, Case-Sensitive) volume. This format is not supported. Format the volume as Mac OS Extended or Mac OS Extended (Journaled) instead.
- During installation, if you specify a FileMaker Server user account other than the default, the specified account must meet the following requirements:
  - **Windows:** The account must be either a local user account or a Windows domain account. The account must have the same privileges as the Windows system account for local file access. If you set up additional database or container data folders on remote volumes, the account must also have full permissions to access these remote folders.
  - **OS X:** The account must be a local user account in OS X and have the same permissions as the `fmserver` account for local file access (including membership in the `daemon` group). The account must not be from a directory service (for example, Active Directory or Open Directory). If you set up additional database or container data folders on remote volumes, the account must also have full permissions to access these remote folders.
- Bonjour installation:
  - **Windows:** Bonjour is optional.
  - **OS X:** If Bonjour is not installed and enabled, then you cannot install FileMaker Server.
  - If Bonjour is not installed, the server cannot be displayed to FileMaker Pro users in the Launch Center window or to FileMaker Go users in the Launch Center. Also without Bonjour, the Deployment assistant cannot automatically locate available worker machines, so you must specify the worker's IP address manually.
- FileMaker Server requires the 64-bit version of Java Runtime Environment version 8 on master and worker machines.
- **Windows:** FileMaker Server requires the Microsoft Application Request Routing (ARR) extension for IIS. If the FileMaker Server installer is unable to download and install this extension (for example, because the machine does not have internet access), then you must download and run the ARR installer manually before the installer can continue. See the Microsoft website for more information.

- **Windows:** Do not uninstall the following while FileMaker Server is installed:
  - IIS URL Rewrite Module
  - Microsoft Application Request Routing
  - Microsoft External Cache for IIS
  - Microsoft Visual C++ 2013 Redistributable Package (x64)
  - Microsoft Web Farm Framework

Next steps

Now that you have deployed FileMaker Server, get started using your new software.

1. **Start Admin Console:** See “Starting Admin Console” on page 52.
2. **Test your installation:** FileMaker Server provides a sample database and a one-click method to verify that your installation is working. See chapter 4, “Testing your deployment.”
3. **Register your software:** Register your copy of FileMaker Server. See “Customer support” on page 94.
4. **Administer FileMaker Server:** For information on how to upload databases, schedule backups, and other regular tasks, see chapter 5, “Administering FileMaker Server.”

Chapter 4
Testing your deployment

This chapter describes how to test that FileMaker Server is working.

Using the FileMaker Server Technology Tests page

The easiest way to test your FileMaker Server deployment is to use the FileMaker Server Technology Tests page.

There are three ways to view the Test page:

- Start Admin Console. Choose **Server** menu > **Open Test Page**.

  If you see a message that a pop-up was blocked, disable pop-up blocking for this website in your web browser.

- Open the Test page by typing the following in a web browser:

  `https://[host]:16000/test`

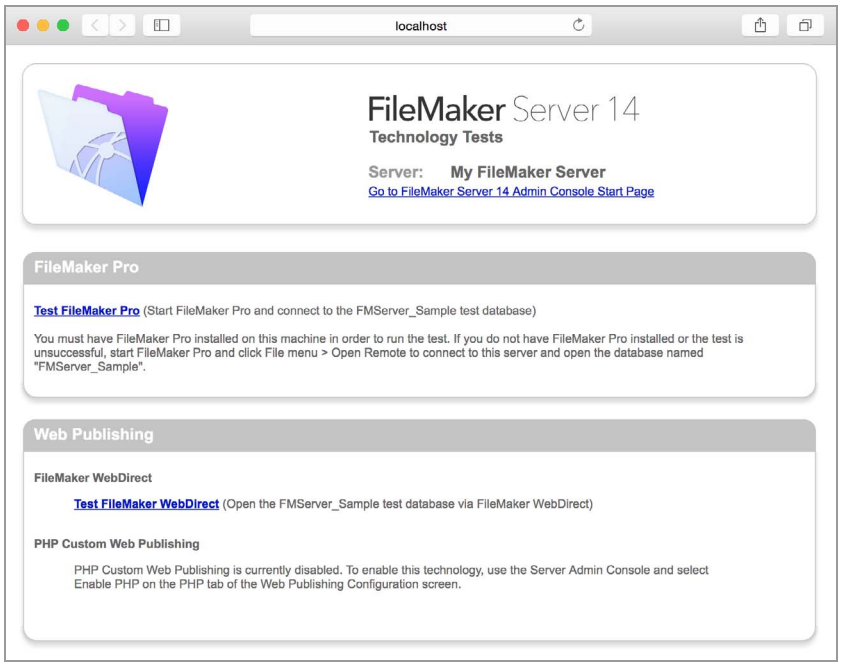
  where [host] is the IP address or host name of the master machine.

- Open the Start page by typing the following in a web browser:

  `https://[host]:16000`

  Then click the **FileMaker Server 14 Technology Tests** link under the **Troubleshooting** heading on the Admin Console Start Page.

Note You can use the Technology Tests page without logging into Admin Console.

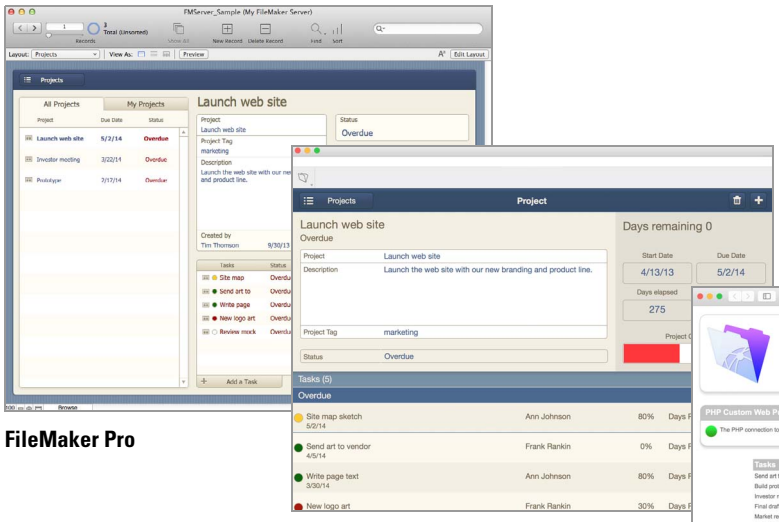


FileMaker Server Technology Tests page

The tests on the FileMaker Server Technology Tests page access the sample database (FMServer_Sample.fmp12) using FileMaker Pro or one of the web publishing technologies. The following table describes the tests available on this page.

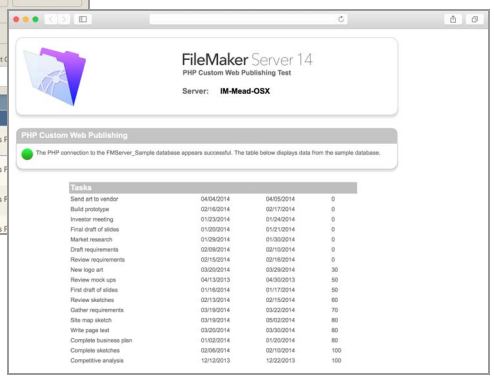
To test	Do this
FileMaker Pro	Click **Test FileMaker Pro**. If FileMaker Pro starts and opens the sample database hosted on FileMaker Server, then the Database Server is working and responding to requests from FileMaker Pro clients. You must have FileMaker Pro or FileMaker Pro Advanced installed locally on the machine where you are conducting the test. To perform the same test another way, start FileMaker Pro on another machine, choose **File** menu > **Open Remote**. In the Launch Center window that opens, click the **Hosts** tab and select the server you want to test, and select **FMServer_Sample**.
FileMaker WebDirect	Click **Test FileMaker WebDirect**. If another web browser window or tab opens and displays the sample database, then FileMaker WebDirect is working. If successful, this test shows that the Database Server, Web Publishing Engine, and web server are working.
Custom Web Publishing with PHP	Click **Test PHP Custom Web Publishing**. If another web browser window or tab opens and displays a table containing data from the sample database, then Custom Web Publishing with PHP is working. If successful, this test shows that the Database Server, Web Publishing Engine, web server, PHP engine, and FileMaker API for PHP are working.

Successful test pages



FileMaker Pro

FileMaker WebDirect



Custom Web Publishing with PHP

Troubleshooting

Deployment assistant reports that the web server test failed

If the Deployment assistant cannot communicate with the web server, you will receive an error message.

To confirm web server settings:

1. In the Test step in the Deployment assistant, confirm the **Protocol**, **Host address**, and **Port** for the web server and click **Retry**.

   You may encounter this during initial deployment or when you click **Server** menu > **Edit Server Deployment**.

2. Examine the **Web Server Test Results**. If the test is:
   - Successful: the result is **Web Server Test Passed**. Click **Next**.
   - Unsuccessful: the Deployment assistant could not communicate with the web server. Make sure that you can access the web server using a web browser from the master machine. If the web server is on a worker machine, make sure the necessary ports are open on the worker machine (see “Before you begin installing on multiple machines” on page 25). To try to communicate with the web server again, click **Retry**.
   - Still unsuccessful: you can disable web publishing for now so that you can complete the Deployment assistant. To disable web publishing, click **Back** until you reach the Technologies step, then click **No, do not enable web publishing**.

Deployment assistant doesn’t start after installation

If the Deployment assistant doesn’t start immediately after you run the FileMaker Server installation program, the most common solutions are:

- On the master machine, start the Deployment assistant by double-clicking the **FMS 14 Admin Console** shortcut on the desktop or entering `http://localhost:16001` in a web browser.
- **Windows:** On the master machine, ensure that IIS is enabled (see chapter 7, “Enabling the IIS web server in Windows”). In IIS Manager, check that the site named FMWebSite has started.
- If the Admin Server process does not respond within 60 seconds to the FileMaker Server installation program, the following message appears:

  The FileMaker Server Admin Console Start page is not available.

  If you see this message, do the following steps in the order shown:
  - Restart the Admin Server process by entering the following command in a command prompt (Windows) or the Terminal application (OS X):

    ```
    fmsadmin restart adminserver
    ```
  - In Windows, you can stop and then restart the FileMaker Server service in the **Administrative Tools** > **Services** control panel.
  - If your server computer has a firewall, make sure all required ports are open in the firewall. (See “Before you begin” on page 9.)
  - If your machine is running slowly, shut down any unnecessary applications.
  - Restart your machine. Open a web browser on the master machine and enter `http://localhost:16001`.

Admin Console doesn't start after deployment on master machine

The most common solutions are:

- On the Admin Console Start Page, click **Start Admin Console**.
- Open a web browser on the master machine and enter `http://localhost:16001`.

Cannot start Admin Console from a remote machine

If you cannot start Admin Console from a remote machine but you can from the master machine, the most common solutions are:

- Ensure that you're using the correct port in the URL:

  `https://[host]:16000/admin-console`

  Note that Admin Console always uses an HTTPS connection on port 16000 from remote machines. You can also use `http://[host]/admin-console`, which works because it is automatically redirected to HTTPS on port 16000. See "Starting Admin Console" on page 52.
- If the master machine has a firewall enabled, then you must open the ports required by FileMaker Server to communicate with users and administrators. For open ports required by a single-machine deployment, see "Before you begin" on page 9. Otherwise, see "Before you begin installing on multiple machines" on page 25.

Web browsers display a certificate message

Most web browsers display a certificate error or warning message when you use an HTTPS connection to go to any web page hosted by the FileMaker Server web server. This includes Admin Console, the Start Page, and any FileMaker WebDirect or Custom Web Publishing solution that uses an HTTPS connection. Displaying this message is expected behavior if your FileMaker Server deployment uses the SSL certificate provided with FileMaker Server.

The most common solutions are:

- To proceed to the desired page, users can click the option in the web browser to continue.
- To prevent this error message, see "Requesting an SSL certificate" on page 69.

Clients cannot see databases hosted by FileMaker Server

The firewall settings on the master machine may be blocking the display of databases to clients. See "Before you begin" on page 9 and "Before you begin installing on multiple machines" on page 25 for more information on which ports need to be unblocked in firewalls.

Because of security improvements in FileMaker Server 14, FileMaker Pro 12 and FileMaker Go 12 clients may not be able to connect to databases hosted by FileMaker Server 14 if the **Use SSL for database connections** setting is enabled in FileMaker Server Admin Console.

Also, a client running FileMaker Pro 11 or earlier or FileMaker Go 11 or earlier cannot see files that are hosted by FileMaker Server 14. Use FileMaker Pro 12, 13, or 14 and FileMaker Go 12, 13, or 14 to open files that are hosted by FileMaker Server 14.

Apache web server used by FileMaker Server stops responding (OS X)

The most common solution is to ensure that no other websites or other HTTP services in OS X are using the same ports required by the web server used by FileMaker Server. For example, if you have the OS X Server application installed and use it to enable HTTP services such as websites or the wiki, the existing Apache instance installed in OS X may be re-enabled after FileMaker Server is installed. Therefore to ensure the Apache instance used by FileMaker Server works normally, you may need to configure any other HTTP services to use different ports from the ports that FileMaker Server uses, disable other HTTP services, or uninstall the OS X Server application.

Chapter 5
Administering FileMaker Server

This chapter explains the basics of how to:

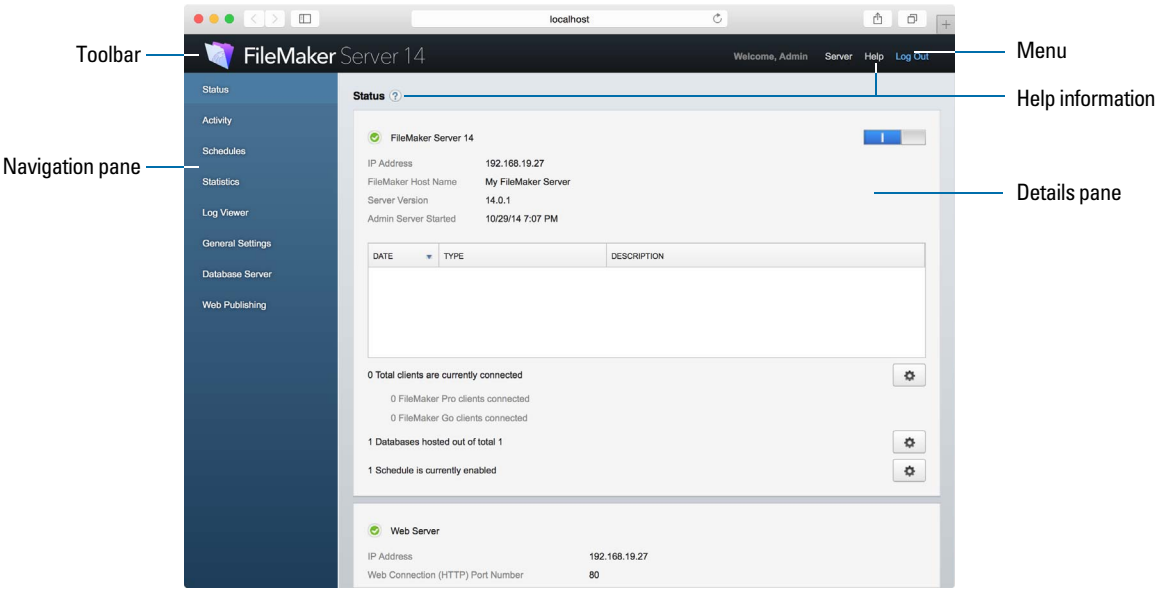
- start FileMaker Server Admin Console
- upload a FileMaker Pro database
- host encrypted FileMaker Pro databases
- back up databases hosted by FileMaker Server
- verify the integrity of databases
- host databases connected to ODBC data sources
- enable ODBC data source single sign-on
- run a server-side script
- monitor client and server activity using statistics
- send messages to FileMaker clients
- view log file entries in Admin Console
- send email notifications of warnings, errors, and completion of scheduled tasks

For detailed information about using Admin Console to administer FileMaker Pro databases and clients that are connected to hosted databases, see FileMaker Server Help.

About FileMaker Server Admin Console

FileMaker Server Admin Console is a web-based application that lets you configure and administer FileMaker Server, work with and monitor hosted databases and clients, and track statistical information.

To administer FileMaker Server, you can use Admin Console on the computer where FileMaker Server is running or on any computer that has network access to the master machine running FileMaker Server. To secure remote administration, Admin Console uses Secure Sockets Layer (SSL) technology to encrypt HTTPS connections from other computers.



FileMaker Server Admin Console

You administer FileMaker Server by choosing options on the menu and Navigation pane. The results are shown in the Details pane, where you can select tasks, specify configuration settings, or monitor activity.

Using Admin Console to administer FileMaker Server

When administering FileMaker Server, you can:

- configure FileMaker Server application properties
- open—or host—a FileMaker Pro database file, making it available to clients on the network
- view information about the files being hosted, like the number of clients accessing each database
- view database statistics in a table or graph
- send messages to connected clients
- close a hosted FileMaker Pro database, making it unavailable to clients
- download a hosted FileMaker Pro database to your local system
- disconnect a selected client from all hosted databases
- pause or resume hosted databases
- create scheduled tasks to back up, verify, and clone hosted databases
- start or stop the Database Server
- delegate database administration tasks to group administrators, use a Group Launch Center to list the databases used by an administrator group
- start or stop the Web Publishing Engine

- configure settings for FileMaker WebDirect
- configure Custom Web Publishing settings for XML or PHP

Note If you click the Back, Forward, or Refresh (or Reload) button in your browser, Admin Console exits and the Login page is displayed. Any unsaved changes in Admin Console are lost, and you must log in again.

Starting Admin Console

You can start Admin Console on a Windows or Mac computer that has network access to the master machine running FileMaker Server. Admin Console is a web-based application hosted on the master machine that you access with a browser.

Note To use Admin Console, your remote computer needs only a supported web browser; no additional runtime environments or browser plug-ins are required. See “Requirements for Admin Console” on page 6.

To start Admin Console:

1. Open a web browser and enter:

   `https://[host]:16000`

   where `[host]` is the IP address or host name of the machine running FileMaker Server as a master. This is the address you noted when you installed FileMaker Server.

2. Before the Admin Console Start Page appears, your web browser may require you to respond to a security message. This is normal behavior for the certificate that is included with FileMaker Server. Click the option to continue to go to the Start Page.

   For information on how to prevent this message in the future, see “Requesting an SSL certificate” on page 69.

   Tip Bookmark the Start Page in your web browser. Come back to this page to access documentation and other resources.

FileMaker Server Start Page

3. Click **Start Admin Console**.
4. On the Login Page, enter the name and password that you chose in the Deployment assistant when you initially deployed FileMaker Server. Click **Log In**.

   Note If your web browser prompts you to save your user name and password, you should decline unless you are sure that access to your web browser is secure.

   Admin Console starts and displays the FileMaker Server Status pane.

The following are alternate ways to start Admin Console directly:

To access Admin Console from	Go to
Any computer with network access to the master machine	https://[host]:16000/admin-console http://[host]/admin-console (redirects to HTTPS)
Master machine only	http://localhost:16001/admin-console FMS 14 Admin Console shortcut: ▪ **Windows 8, Windows Server 2012 R2:** On the Windows Start screen, click **FMS 14 Admin Console**. ▪ **Windows Server 2008 R2:** Click the **Start** button > **All Programs** > **FileMaker Server** > **FMS 14 Admin Console**. ▪ **OS X:** Double-click the **FMS 14 Admin Console** shortcut on the desktop.

Uploading databases

FileMaker provides two ways to upload databases to FileMaker Server:

- In FileMaker Pro, use **File** menu > **Sharing** > **Upload to FileMaker Server** to transfer FileMaker Pro databases from your computer's file system to FileMaker Server if both computers are on the same network. FileMaker Pro uploads database files along with any externally stored container field objects. FileMaker Server copies the database files to the specified database folder and sets file permissions and privileges so that you can access the databases after they are uploaded.
- Manually upload database files to FileMaker Server. You must copy the database files and any externally stored container field objects to the proper location. In OS X, change the files' group ownership to belong to the `fmsadmin` group. For more information about uploading FileMaker Pro files to the server, see FileMaker Server Help.

Note If any of your databases require a plug-in, see FileMaker Server Help for information about managing plug-ins.

Encrypting databases

In FileMaker Pro Advanced, you can use the database encryption feature to encrypt the contents of a database file. Encryption protects the FileMaker database file and any temporary files that are written to disk.

Note For more information about encrypting a database, see FileMaker Pro Help.

When you use the database encryption feature, it encrypts the database content by combining the database file's encryption password and a randomly generated, universally unique identifier (UUID), also known as a *salt*. This unique encryption password encrypts the data when it is stored on disk so if someone steals a copy of the database, the database's contents can't be viewed.

Encrypting databases in FileMaker Pro Advanced

In FileMaker Pro, you can restrict user actions while a database is open by setting the user's privileges in the file. To protect the database when it is stored on disk, use the database encryption feature in Developer Utilities (FileMaker Pro Advanced). You can also decrypt or re-encrypt a FileMaker database file with Developer Utilities. The encryption process can take some time for large database files, so a progress dialog box displays and shows the current status. For more information about database encryption, see FileMaker Pro Help.

To host an encrypted database file on FileMaker Server for FileMaker clients, you can manually upload the database to FileMaker Server or use the **Upload to FileMaker Server** menu command in FileMaker Pro to transfer the file. In either case, you must open an encrypted database using Admin Console or the `fmsadmin` command line interface (CLI). See FileMaker Server Help for more information.

Opening encrypted databases

You can open an encrypted database that is hosted on FileMaker Server by using Admin Console or a CLI command. As the FileMaker Server administrator, you should open the file with its encryption password, so that FileMaker clients can use the encrypted database. When you open the encrypted file from Admin Console, the encryption password dialog box displays and you must enter the password. Because you opened the database, FileMaker clients don't need the encryption password to access that database.

For more information about opening an encrypted database, see FileMaker Server Help.

Note Use the `list` command to check whether a database is encrypted.

Backing up databases

FileMaker recommends that you back up your hosted databases. FileMaker Server provides two ways for you to perform database backups:

- **Scheduled backups.** With scheduled backups, you use the Schedule assistant to create a scheduled task that defines which databases are backed up, and how often the databases are backed up. Every time the scheduled task runs, FileMaker Server checks whether the selected databases have changed since the last backup. FileMaker Server creates a full copy of the databases that have changed and creates hard links to the backed up databases that have not changed.
- **Progressive backups.** With progressive backups, FileMaker Server starts by creating a full backup of all hosted databases. After the initial full backup is complete, FileMaker Server subsequently copies just the changed blocks from the hosted file to the backup folder, on a frequency based on what you specify for the save interval setting. Because the subsequent progressive backup copies only the blocks that have changed during the save interval, the progressive backup can run much more quickly than a scheduled backup, with less impact on Server performance.

If your database uses container fields that store data externally, you can specify whether to back up the container file folders. By default the container folders are not backed up. For more information, see FileMaker Server Help.

You can use both scheduled backups and progressive backups to ensure a comprehensive backup strategy for your hosted databases. When FileMaker Server backs up an encrypted database, the backup is also encrypted.

Note If you use Time Machine in OS X, exclude FileMaker Server folder items from the Time Machine backup. Use FileMaker Server Admin Console to back up your database files.

Scheduling database backups

Use the FileMaker Server Schedule assistant to create a scheduled task to:

- back up all hosted databases
- back up hosted databases that are in a specified folder
- back up a specified database

To create a scheduled task for backing up databases, choose the Admin Console **Schedules** pane, click , and choose **Create a Schedule**. Then, choose **Back up databases**, and specify whether you want to back up hourly, daily, weekly, or on a custom schedule. You can also select the maximum number of database backups you want to keep for a scheduled backup.

Database backups are saved in the default backup folder or in a folder that you specify. You can specify the default backup folder on the Admin Console **Database Server** > **Folders** tab.

Note If you are backing up a database to a volume that supports Windows ReFS, see “Creating a backup to a Windows ReFS volume” on page 56 for more information.

When FileMaker Server backs up a database, it copies the database while it is active. Users can continue to make modifications. When the copy is complete, the database is paused to synchronize backup files with the current database and then the database is resumed. You can set options to verify the backup, save a clone of the database without the data, and send email notifications to clients.

Using progressive backup

To enable progressive backup and specify the folder for progressive backup files, choose the Admin Console **Database Server > Folders** tab. For **Progressive Backup Folder**, select **Enable progressive backups**. Enter the number of minutes for **Save interval**, and enter the location of the progressive backup folder.

Creating a backup to a Windows ReFS volume

FileMaker Server can make full backups on any local volume that supports Windows Resilient File System (ReFS); however, the backup process may take more time and require more disk space.

Note Creating backups on remote ReFS volumes is not supported. For more information, see FileMaker Server Help.

When backing up a database, FileMaker Server checks if the backup volume uses ReFS. If the file is not being backed up to a ReFS volume, FileMaker Server checks if the selected databases have changed since the last time that scheduled backup ran. For each scheduled backup task, FileMaker Server creates a full copy of the databases that have changed and creates hard links to the backed up databases without any changes.

Because ReFS doesn’t support hard links, FileMaker Server must create a full backup even if the hosted database file is identical to the most recent backup file.

Verifying the integrity of databases

Use the FileMaker Server Schedule assistant to create a scheduled task to:

- verify all hosted databases
- verify hosted databases that are in a specified folder
- verify a specified database

To create a scheduled task for backing up databases, choose the Admin Console **Schedules** pane, click , and choose **Create a Schedule**. Then, choose **Verify databases**, and specify how often you want to verify the databases.

Hosting databases connected to ODBC data sources

FileMaker Server can host FileMaker Pro databases that are connected to external SQL data sources. In FileMaker Pro, you can work with the ODBC data in much the same way that you work with data in a FileMaker file. For example, you can add, change, delete, and search external data interactively.

See FileMaker Server Help for more information on using ODBC and JDBC with FileMaker Server and accessing external ODBC data sources.

Note You do not need to enable the OBDC/JDBC data source feature of FileMaker Server to host FileMaker Pro databases that access an external SQL data source via ODBC.

Enabling ODBC data source single sign-on (Windows)

If you work with FileMaker Pro databases hosted by FileMaker Server that access ODBC data from Microsoft SQL Server, you can configure the master machine to enable single sign-on (SSO). ODBC data source single sign-on allows FileMaker Pro clients to use their Windows-authenticated login credentials and permissions to access Microsoft SQL Server without logging in.

To enable ODBC data source single sign-on with FileMaker Server, you must configure the FileMaker Server service on the master machine to log in using the privileged user account. That is, this user account must have the **Impersonate a client after authentication** privilege enabled, and the account must be an Administrator account and configured in Windows Active Directory on the network.

Important Before you can enable ODBC data source single sign-on, your Windows domain administrator must:

- Configure the **Account is trusted for delegation security** setting for each user's Windows user account.
- Configure the **Trust this user for delegation** and **Use Kerberos only** security settings for the privileged user account on the master machine.
- Enable the **Impersonate a client after authentication** privilege for the privileged user account on the master machine.
- Configure the ODBC DSN to use **Windows authentication** on the master machine.
- Configure Microsoft SQL Server to use **Windows authentication**.

To enable ODBC data source single sign-on on the master machine:

1. Choose **Control Panel > Administrative Tools > Services > FileMaker Server**, then choose **Action > Properties**.
2. On the **Log On** tab, choose **This account**.
3. For **This account**, enter the privileged user account on the master machine, then click **OK**.
4. Choose **Control Panel > Administrative Tools > Local Security Policy > Local Policies > User Rights Assignments > Act as part of the operation system**.
5. On the **Local Security Setting** tab, click **Add User or Group**, then enter the privileged user account you specified earlier for **This account**.
6. Click **OK**, then restart the FileMaker Server service.

Important You must also enable ODBC data source single sign-on in the FileMaker Pro databases hosted by FileMaker Server. For more information, see FileMaker Pro Help.

Running server-side scripts

You can create scheduled tasks to run:

- system-level scripts—for example, Windows batch, Perl, VBScript, and AppleScript
- FileMaker scripts in databases hosted by FileMaker Server
- script sequences that combine a FileMaker script with an optional pre-processing system-level script and an optional post-processing system-level script

To create a scheduled task for scripts, choose the Admin Console **Schedules** pane, click , and choose **Create a Schedule**. Then, choose **System-level script**, **FileMaker script**, or **Script sequence**. The Schedule assistant guides you through the rest of the process.

System-level scripts

Script files must be placed in the Scripts folder on the master machine in your FileMaker Server deployment. To schedule a system-level script to run, start the Schedule assistant as described above by choosing **System-level Script**. Next, select the script file you want to run.

System-level scripts can perform whatever tasks you need to perform at the operating system level on the master machine. For more information, see the documentation for the scripting language you want to use.

See FileMaker Server Help for more information about running system-level scripts as scheduled tasks.

FileMaker scripts

To schedule a FileMaker script to run, start the Schedule assistant as described above by choosing **FileMaker script**. Next, select the database that contains the script you want to run, then the script.

FileMaker scripts can do simple tasks or complex tasks. For example, you can write a FileMaker script to remove duplicate records or to validate the format of phone numbers. You can schedule these scripts to run during off hours, perhaps before a daily backup.

Scripts can incorporate conditional decisions (if-else statements) and perform repetitive tasks (loop statements). You use the Script Workspace feature in FileMaker Pro to build scripts by selecting from a list of supported FileMaker Pro commands, called script steps, and specifying options (if necessary).

To find out if a FileMaker script step is supported from a FileMaker Server schedule, select **Server** for **Show Compatibility** in the Script Workspace window. For more information, see the script step reference in FileMaker Pro Help.

See FileMaker Server Help for more information about running FileMaker scripts as scheduled tasks.

Script sequences

To create a script sequence, start the Schedule assistant as described above by choosing **Script sequence**. Next, select the database that contains the FileMaker script you want to run, then the script. Next, select an optional pre-processing system-level script, an optional post-processing system-level script, or both.

See FileMaker Server Help for more information about running script sequences as scheduled tasks.

Displaying server statistics

You can view a summary of connection statistics and database statistics attributes for FileMaker Server by choosing **Statistics** > **Server** tab. The statistics can help you diagnose performance issues, client access to the server and prevent certain processes on FileMaker Server from running slow.

You can view the following information:

- Server statistics in the **Statistics** > **Server** tab. You can view the statistics in a table and graph format. The types of information you can view include the percentage of times FileMaker Server retrieved data from the cache (RAM) rather than the hard disk, percentage of cache unsaved, the amount of data read from disk, data written to disk, and client call times.
- Client connection information in the **Statistics** > **Clients** tab. These statistics are collected during remote calls made by each FileMaker client, all Web Publishing Engine (WPC) clients, and all ODBC and JDBC clients.

For more information about each feature, see FileMaker Server Help.

Sending messages to FileMaker clients

You can send messages to notify FileMaker Pro, FileMaker Go, and FileMaker WebDirect clients about important events such as server shutdowns, database maintenance, or deadline reminders. You can send messages to:

- all FileMaker clients or selected FileMaker clients connected to hosted databases
- FileMaker clients connected to any database or selected databases hosted by FileMaker Server
- FileMaker clients as a scheduled task

To send messages to FileMaker clients, choose the Admin Console **Activity** > **Clients** tab, then select one or more clients from the list. Click , then choose **Send Message** or **Send Message to All Clients** to enter the message.

To send messages to FileMaker clients connected to selected databases, choose the Admin Console **Activity** > **Databases** tab and select a folder or database file. Click , then choose **Send Message** (for database files only) or **Send Message to All Clients** to enter the message.

To create a scheduled task for sending messages, choose the Admin Console **Schedules** pane, click , and choose **Create a Schedule**. Then select **Send message**, choose databases whose users will receive the message, create the message, and set up a schedule to deliver it.

Viewing log file entries in Admin Console

FileMaker Server tracks activity, client access, and other information as it operates and stores this information in log files.

- To view, sort, filter, and export a snapshot of the log file entries, choose the Admin Console **Log Viewer** pane, select one or more log file modules for **Modules**, and select a date range for **Start** and **End**.
- To filter the log file entries displayed in the Log Viewer pane, select a message type (**All**, **Error**, **Warning**, or **Information**) for **Type**.
- To view the most recently logged events, click **Refresh**.

For more information about using the **Log Viewer** pane, see FileMaker Server Help.

Emailing notifications

You can configure FileMaker Server to send SMTP email notifications about errors and warnings as well as completion of scheduled tasks. Emails allow for more timely notification of these events, without having to locate the information in system or event logs on the computer running FileMaker Server.

You can send emails:

- when FileMaker Server errors and warnings (optional) occur
- when a scheduled task is finished

Specify your SMTP mail server settings in FileMaker Server, including the SMTP server address, the port number, user name and password, and the list of email addresses that will receive the email messages.

Each email notification type is configured separately in FileMaker Server, allowing for different recipients for each type of email:

- Configure FileMaker Server to send error or warning emails on the Admin Console **General Settings** > **Email Notifications tab**. You can specify a list of email addresses that will receive error or warning emails on this tab. You can also use Secure Sockets Layer (SSL) data encryption and Transport Layer Security (TLS) when FileMaker Server connects to the SMTP email server.
- Enable email notifications when you create a scheduled task with the Schedule assistant. The scheduled task will send email notifications to the email addresses specified in the Schedule assistant. The SMTP server used for email notifications is configured on the **General Settings** > **Email Notifications** tab.

For more information about email notifications, see FileMaker Server Help.

Using the command line interface

FileMaker provides the tool `fmsadmin` for administering FileMaker Server via the command line interface (CLI). You must be logged on to the computer running FileMaker Server, either directly or using remote desktop software, to use the CLI. The CLI is available via the command prompt (Windows) and the Terminal application (OS X). CLI commands can also be used in a script or batch file.

Command line interface files

The CLI executable `fmsadmin` is located in the folder:

- **Windows:** [drive]:\Program Files\FileMaker\FileMaker Server\Database Server\fmsadmin.exe
- **OS X:** /Library/FileMaker Server/Database Server/bin/fmsadmin

Notes

- **Windows:** If FileMaker Server is installed in a non-default location, the beginning portion of the default path shown above, \Program Files\FileMaker\FileMaker Server, is replaced with the path that was specified during installation. For example: \My_Path\Database Server\
- **OS X:** The following symbolic link to `fmsadmin` is also installed: /usr/bin/fmsadmin

Command line interface commands

The general format for fmsadmin commands is:

```
fmsadmin command [options]
```

The following example authenticates with Admin Console user name *admin* and the password *pword*, and closes all open databases without prompting you to confirm:

```
fmsadmin close -y -u admin -p pword
```

Important CLI commands can include the Admin Console name and password. If a command is used interactively, the user name is visible but the password is not. If a command in a script or batch file must include a name and password, be sure that only the password owner can view the script or batch file.

In the CLI, use the `help` command to see Help pages that list what commands and options are available and how to use them:

```
fmsadmin help
```

Chapter 6
Upgrading or moving an existing installation

You can upgrade an existing installation of FileMaker Server 12 or 13 to FileMaker Server 14. You can also move an existing installation of FileMaker Server 14 to other machines.

If you are upgrading from a previous version to FileMaker Server 14, you must have the license key of the previous version. The installer prompts you to enter the new upgrade license key and the previous license key. To update the license of an existing deployment of FileMaker Server 14, see “Updating the FileMaker Server 14 license key” on page 7.

The steps listed below outline the process. See the remaining sections for information about each step.

Important You must perform the steps in the order they are presented.

1. If you are using FileMaker Server 13 or 14, save the settings for your schedules and administrator groups.
2. Note your existing FileMaker Server settings.
3. Stop FileMaker Server.
4. Make a copy of any database files and shell script files you used with FileMaker Server.
5. Uninstall FileMaker Server.
6. Clear the Java cache and web browser cache to clear information from the previous FileMaker Server install.
7. Install FileMaker Server 14.
8. Move any database files or script files you used with the previous version of FileMaker Server to the proper folders within the FileMaker Server 14 folder structure.
9. If you are moving from a previous FileMaker Server 13 or 14 installation, load the settings for your schedules and administrator groups after installation.

   Note Because of file encryption changes, you cannot load a FileMaker Server 12 Schedules and Groups settings file directly into FileMaker Server 14. If you want to retain the schedules and groups that you used in FileMaker Server 12, load your FileMaker Server 12 Schedules and Groups settings file into FileMaker Server 13, then save the information into a FileMaker Server 13 Schedules and Groups settings file. A FileMaker Server 13 Schedules and Groups settings file can be loaded directly into FileMaker Server 14.

10. Configure FileMaker Server.

OS X: If you upgrade your machine from one supported version of OS X to another after FileMaker Server is installed, you may need to update your FileMaker Server deployment. See “Upgrading OS X on machines running FileMaker Server” on page 68.

Step 1. Save your schedules and administrator groups

You can save the settings for your schedules and administrator groups that are configured in the current installation.

1. Start FileMaker Server Admin Console.
2. Choose **Server** menu > **Save Schedules and Groups**. By default, the file is saved in your web browser's download folder.

After you install FileMaker Server 14, you can then load the settings for your schedules and administrator groups to instantly configure them in the new installation.

Note For FileMaker Server 13, the default name of the Schedules and Groups settings file is fms13_settings.settings. For FileMaker Server 14, the default name of the Schedules and Groups settings file is fms14_settings.settings. You cannot specify a different name when you save the file in Admin Console, but you can change the filename using your operating system tools after you save the file.

Step 2. Note your FileMaker Server settings

Make a note of your existing FileMaker Server settings because you will have to reenter your settings manually later. Some examples are:

- Note the name of your FileMaker Server installation (the name users see in the Launch Center window in FileMaker Pro).
- If you are using FileMaker Server 13 or 14, save the schedules and groups settings in a file. See "Step 1. Save your schedules and administrator groups" on page 63.
- Note other settings that you have changed from the defaults and want to reuse in your FileMaker Server 14 deployment.

Where to note settings for FileMaker Server

Before moving an existing installation of FileMaker Server to another machine, start FileMaker Server Admin Console (see "Starting Admin Console" on page 52 for FileMaker Server 14). For FileMaker Server 12, note the settings in the Configuration pane. For FileMaker Server 13 and 14, note the settings in the General Settings, Database Server, and Web Publishing panes.

Step 3. Stop FileMaker Server

To stop FileMaker Server 12:

1. In Admin Console, choose **Server** menu > **Stop Web Publishing**.

   Wait until the Web Publishing Engine has stopped.
2. Choose **Server** menu > **Stop Database Server**.

   Wait until the Database Server has stopped.
3. Stop the FileMaker Server service (Windows) or processes (OS X). For more information, see FileMaker Server Help.

To stop FileMaker Server 13 or FileMaker Server 14:

1. In the Admin Console **Status** pane, turn off **Web Publishing Engine**.

   Wait until the Web Publishing Engine has stopped.

2. Turn off **FileMaker Server 13** or **FileMaker Server 14**.

   Wait until the Database Server has stopped.

3. Stop the FileMaker Server service (Windows) or processes (OS X). For more information, see FileMaker Server Help.

Step 4. Make a copy of databases, scripts, and plug-ins

Make a copy of any database files, shell script files, and plug-ins you used with FileMaker Server. In a default FileMaker Server installation, they are stored on the master machine in the following folders.

FileMaker Server 12, 13, and 14 files (default installation)

Windows:

- \Program Files\FileMaker\FileMaker Server\Data\Databases
- \Program Files\FileMaker\FileMaker Server\Data\Scripts\
- \Program Files\FileMaker\FileMaker Server\Database Server\Extensions\

OS X:

- /Library/FileMaker Server/Data/Databases/
- /Library/FileMaker Server/Data/Scripts/
- /Library/FileMaker Server/Database Server/Extensions/

FileMaker Server 12, 13, and 14 files (non-default installation in Windows)

When you install FileMaker Server in a non-default location in Windows, the beginning portion of the default path, \Program Files\FileMaker\FileMaker Server, is replaced with the path you specified during installation.

User-specified location\Data\Databases

User-specified location\Data\Scripts\

User-specified location\Database Server\Extensions\

Step 5. Uninstall FileMaker Server

After you have noted the settings in your existing installation of FileMaker Server, you can uninstall FileMaker Server.

Important The uninstall process deletes your settings, so be sure to write down any settings that you want to save. See “Step 2. Note your FileMaker Server settings.”

Windows

To uninstall a multiple-machine deployment, uninstall the worker machines first.

To uninstall FileMaker Server:

1. Start Windows.
2. Open Control Panel, then click **Uninstall a program** (or **Programs and Features**).
3. Select the FileMaker Server product (for example, **FileMaker Server 14**) from the list and click **Change**.
4. When the Installation program starts, click **Next**.
5. Select **Remove**, then click **Next** and **Remove**.
6. If a User Account Control alert appears, click **Yes**.

   Your database files, script files, and plug-ins are not deleted.
7. Click **Finish**. If you're uninstalling FileMaker Server 12, click **Yes** to restart the machine.

OS X

To uninstall a multiple-machine deployment, uninstall the worker machines first.

Note For your convenience, the FileMaker Server 13 uninstaller is included in the FileMaker Server 14 installation disk image. You can find **FMS 13 Uninstaller** in the Extras folder.

To uninstall FileMaker Server:

1. Insert the DVD into the drive or follow your electronic download instructions.
2. Double-click the FileMaker Server installation icon (for example, **FileMaker Server 14**).

3. Enter your OS X user name and password.
4. Read the Before You Begin information and click **Continue** (OS X).
5. Review and accept the end user license agreement. You may need to enter your OS X user name and password again.
6. For **Installation Type**, choose **Uninstall** and click **Next**.
7. Click **Yes** to confirm that you want to uninstall FileMaker Server. Some files and folders cannot be removed.
8. Click **OK** or **Quit**.
9. If you are uninstalling FileMaker Server 12, restart the machine after uninstalling.

Step 6. Clear the Java cache and web browser cache

Even after you uninstall FileMaker Server, the Java cache may retain pointers to FileMaker Server components that have been uninstalled. In addition, your web browser may retain cached versions of artwork and HTML files that have been uninstalled.

Clear the Java cache and web browser cache to clear information from the previous FileMaker Server install.

Step 7. Install FileMaker Server 14

To install FileMaker Server, you must use an account with administrative privileges.

- To deploy on a single machine, see chapter 2, “Installation quick start.”
- To deploy across multiple machines, see chapter 3, “Deploying FileMaker Server across multiple machines.”

Note If you enter an upgrade license key in the Personalization dialog box, the Upgrade dialog box prompts you for a valid license key from the previous version of the product.

The FileMaker Server installer and the Deployment assistant prompts you for some of the settings that you noted in “Step 2. Note your FileMaker Server settings” on page 63.

Step 8. Move files to the proper location

Move the script files and plug-ins you used with the previous version of FileMaker Server to the proper folders within the FileMaker Server 14 folder structure. See “Step 4. Make a copy of databases, scripts, and plug-ins” on page 64.

Note You can use FileMaker Pro 14 to transfer .fmp12 databases to your new FileMaker Server deployment. See “Uploading databases” on page 54. To transfer your database files manually, see FileMaker Server Help.

Important If you are using FileMaker Server 14 and you want to transfer settings by loading the Schedules and Groups settings file, make sure you have created a folder structure in the new FileMaker Server installation that is identical to the source server installation. Copy the databases, scripts, and other solution files from the source installation to the new FileMaker Server installation, and set the appropriate permissions in OS X. For more information, see FileMaker Server Help.

Step 9. Load your schedules and administrator groups

If you are moving from a previous FileMaker Server 13 or 14 installation, you can load the Schedules and Groups settings file after installation. See “Step 1. Save your schedules and administrator groups” on page 63.

Important Whenever you load a Schedules and Groups settings file, all existing schedules and administrator groups settings in the new FileMaker Server installation are deleted and replaced by the settings in the Schedules and Groups settings file. You cannot merge the schedules and administrator groups settings from multiple FileMaker Servers.

Note Because of file encryption changes, you cannot load a FileMaker Server 12 Schedules and Groups settings file directly into FileMaker Server 14. If you want to retain the schedules and groups that you used in FileMaker Server 12, load your FileMaker Server 12 Schedules and Groups settings file into FileMaker Server 13, then save the information into a FileMaker Server 13 Schedules and Groups settings file. A FileMaker Server 13 Schedules and Groups settings file can be loaded directly into FileMaker Server 14.

1. In Admin Console for the new FileMaker Server 14 installation, choose **Server** menu > **Load Schedules and Groups**.
2. Click **Choose File** and navigate to the folder where you saved the Schedules and Groups settings file. For each FileMaker Server version, the default filename for settings is given below.

FileMaker Server version	Default filename for settings
13	fms13_settings.settings, unless you changed the filename using your operating system tools
14	fms14_settings.settings, unless you changed the filename using your operating system tools

3. Select the Schedules and Groups settings file and click **Choose**.
4. Click **Load** to load the Schedules and Groups settings file into FileMaker Server.
5. Do one of the following:
   - If the Load Successful message appears, no errors occurred.
   - If the Load Schedules and Groups Results dialog box appears, note the errors that occurred so that you can make the necessary corrections, and then click **OK**.

For more information, see FileMaker Server Help.

Step 10. Configure your deployment

You can now start Admin Console and configure your FileMaker Server deployment using the settings you noted in “Step 2. Note your FileMaker Server settings” on page 63. For more information on configuring your deployment, see FileMaker Server Help.

For information on how to upload databases, schedule backups, and perform other regular tasks, see chapter 5, “Administering FileMaker Server.”

Upgrading OS X on machines running FileMaker Server

Different versions of OS X require different versions of PHP. If you are currently running FileMaker Server in an earlier supported version of OS X and you want to upgrade to a later supported version of OS X, you need to use the Deployment assistant to update the server deployment in the new operating system. For a list of supported versions of OS X, see “Requirements for Admin Console” on page 6.

To update your FileMaker Server deployment:

1. After upgrading to a later supported version of OS X, start FileMaker Server Admin Console.

   See “Starting Admin Console” on page 52.

2. In Admin Console, click **Server** menu > **Edit Deployment**.

3. Verify all your deployment options and click **Next** in each step.

4. In the last step, click **Finish** to update your FileMaker Server deployment.

   The Deployment assistant configures the Web Publishing Engine to use the PHP version appropriate for the version of OS X that is currently running.

Alternatively, you can uninstall and install FileMaker Server.

Chapter 7
Setting up the web server

In all deployments, FileMaker Server uses Internet Information Services (IIS) in Windows or Apache in OS X. In a two-machine deployment, the web server on the worker serves web publishing clients; on the master machine, the web server hosts the web-based Admin Console application and handles some data transfer tasks. In a single-machine deployment, all of these functions are performed by one web server.

This chapter describes the basics of requesting a custom SSL certificate, enabling the web server, and configuring additional IIS authentication settings. For more information on how to configure the web server, see the documentation for the web server.

Requesting an SSL certificate

FileMaker Server uses Secure Sockets Layer (SSL) technology to encrypt HTTPS connections between the web server and users' web browsers for Admin Console, FileMaker WebDirect, and Custom Web Publishing. The Database Server can also use SSL encryption for connections with FileMaker Pro clients, FileMaker Go clients, and the Web Publishing Engine.

Admin Console provides two settings on the **Database Server** > **Security** tab that enable secure connections with clients:

- **Use SSL for database connections** – With this setting, data passed between FileMaker Server and FileMaker WebDirect, Go, and Pro clients is encrypted and sent over SSL connections instead of over unencrypted TCP connections.
- **Use SSL for progressive downloading** – With this setting, interactive content is encrypted and sent over HTTPS connections as it downloads to clients.

  For more information on how to use secure connections, see FileMaker Server Help.

SSL uses digital certificates to certify the ownership of the public key used to encrypt data. FileMaker Server provides a standard SSL certificate signed by FileMaker, Inc. that does not verify the server name. This certificate is used by all FileMaker Server components that use SSL. However, because this certificate doesn't verify the server name, most web browsers will warn users of a problem with the website's security certificate. For some web browsers, certificate issues can affect performance and functionality as well. The FileMaker default certificate is intended only for test purposes. A custom SSL certificate is required for production use.

You can request a custom SSL certificate that matches your specific server name from a trusted CA supported by FileMaker, Inc. One option is to use the CLI `certificate` command to create a Certificate Signing Request (CSR), which you send to a certificate authority, and a private key that you keep secret. When you receive your signed certificate from the certificate authority, use a similar command to import the certificate with your private key.

Alternatively, there are tools that you can use to create a CSR so that you can request a certificate directly from a CA without using the FileMaker Server CLI commands. If you obtain a custom SSL certificate without using the CLI `certificate` command, you can import the certificate using Admin Console. On the **Database Server** > **Security** tab, click **Import Certificate**.

Note The Import Certificate feature in Admin Console is not for certificates created using the CLI `certificate` command. If you use the CLI `certificate` command to generate a certificate, then you should use the CLI `certificate` command to import the certificate.

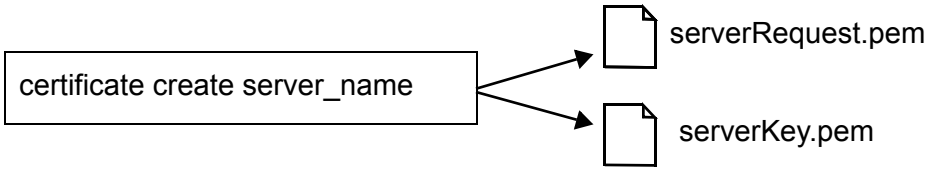
Using the CLI certificate command

Use the CLI `certificate` command to create a signed certificate matching the server name or domain name system (DNS) name for a fully secure SSL connection with FileMaker Server.

FileMaker Server ships with a default certificate that is installed on the Database Server and a root certificate that ships with the FileMaker Pro and FileMaker Go software. If you are using this certificate, make sure that the server certificate is installed on the machine running the Database Server, and the client certificate is installed on the FileMaker Pro and FileMaker Go client computers.

You can use the `certificate` command and request a signed certificate from a certificate authority (CA) that matches your specific server name or DNS name. A CA issues digital certificates that contain a public key and the identity of the owner. When you create the certificate request, a private key is generated that corresponds with the public key.

- Use the `certificate create` command to create the certificate request file that you send to the certificate authority (serverRequest.pem), plus an encrypted private key file that is used by the `certificate import` command (serverKey.pem).



- Use the `certificate import` command to create a custom server .pem file. This custom server .pem file combines the certificate file that you receive from the certificate authority with the encrypted private key file created by the `certificate create` command.

Note To write information to the serverkey.pem file, you must have administrator privileges. If you don't have administrator privileges, Windows or OS X generates an error. To prevent this error:

- **Windows:** Open the command prompt window using Run as Administrator.
- **OS X:** Authenticate as `sudo` to run commands as the superuser.

Format

```
fmsadmin certificate create server_name
fmsadmin certificate create subject
fmsadmin certificate import certificate_file
```

Options

server_name | *subject*

server_name or *subject* is required for the `certificate create` command.

server_name is the value used by clients to open hosted files with the FileMaker Network protocol, fmnet.

For example, if FileMaker Pro clients use `fmnet:/salesdbs.mycompany.com/sales` to open the hosted database sales, then use the following command with salesdbs.mycompany.com as the `server_name`:

```
fmsadmin certificate create salesdbs.mycompany.com
```

`subject` may be used to include more information than the server name. (Some certificate authorities require additional information.) `subject` uses the same syntax as the argument in the `openssl req [-subj arg]` command:

- *subject* is not case sensitive.
- *subject* must be formatted as `/type0=value0/type1=value1/type2=...`, where each `type=value` pair is an attribute type and a value specifying a relative distinguished name.
- Use the backslash character (\) to escape special characters.
- Use quotation marks to enclose the subject string if it includes space characters.

For example, to use the DNS common name salesdbs.mycompany.com and the country value US, use the following command:

```
fmsadmin certificate create /CN=salesdbs.mycompany.com/C=US
```

The following example shows additional attributes that may be specified using the subject option:

```
fmsadmin certificate create "/CN=ets-srvr.filemaker.com/O=FileMaker DBS
Test/C=US/ST=California/L=Santa Clara"
```

The `certificate create` command creates two output files:

- The certificate request file: serverRequest.pem.

  Submit the serverRequest.pem file to the certificate authority using the process provided by the certificate authority.

- The encrypted private key file: serverKey.pem.

  The `certificate import` command combines this file with the certificate file returned to you by the certificate authority.

`certificate_file`

`certificate_file` is required for the `certificate import` command.

`certificate_file` is the full pathname to the custom SSL certificate file that you received from the certificate authority. You may use an absolute pathname or a relative pathname.

For example, if the certificate file is c:\Documents\signedCertificate.crt, then use the following command:

```
fmsadmin certificate import c:\Documents\signedCertificate.crt
```

The `certificate import` command combines the signed certificate file with the serverKey.pem file and creates a file called serverCustom.pem. The serverCustom.pem file is created in the CStore folder:

- **Windows:** [drive]:\Program Files\FileMaker\FileMaker Server\CStore\serverCustom.pem
- **OS X:** /Library/FileMaker Server/CStore/serverCustom.pem

To use the `certificate import` command:

- **Windows:** You must have administrator permission to the CStore folder.
- **OS X:** You must have read and write access permissions to the CStore folder.

After using the `certificate import` command, you must restart the Database Server.

When the Database Server starts, if it is unable to find serverCustom.pem, it will use the default server.pem file.

For more information about enabling SSL, see the FileMaker Server Help topic “Securing your data.”

Notes

- The Database Server and web server components must use the same certificate. Do not add a separate certificate for the web server, for example, by using IIS certificate tools or by using OpenSSL certificate tools. Either use the Admin Console import certificate feature or use the CLI command to import the certificate.
- If you are using a two-machine deployment, you must run the `certificate import` command on both machines.
- The signed certificate must use base-64 encoding.
- FileMaker Server does not support validation using a certificate revocation list (CRL validation).
- For more information about supported certificates, see the FileMaker Knowledge Base at http://help.filemaker.com.

Enabling the IIS web server in Windows

The IIS web server must be enabled on the master and worker machines in order for FileMaker Server to operate. The FileMaker Server installer installs the Microsoft Application Request Routing (ARR) extension for IIS if it is not present. If the ARR installer detects that IIS is not enabled, it will enable IIS. However, if you need to enable IIS manually, follow the steps below for the supported version of Windows you're using.

To enable IIS in Windows 8:

1. Choose **Control Panel** > **Programs**.
2. Click **Turn Windows features on or off**.
3. Select **Internet Information Services**, then click **OK**.

To enable IIS in Windows Server 2008 R2:

1. Click the **Start** button > **Administrative Tools** > **Server Manager**.
2. Click **Add Roles**.
3. In the Add Roles wizard, select **Web Server (IIS)**, then click **Next**.
4. Choose the IIS role services to install. Click **Next** to accept the defaults.
5. Add any role services as required.
6. Click **Close** to exit the wizard.

To enable IIS in Windows Server 2012 R2:

1. On the Windows Start screen, choose **Server Manager**.
2. Click **Manage** menu > **Add Roles and Features**.
3. Select **Role-based or feature-based installation**, then click **Next**.
4. Select the server, then click **Next**.
5. Choose **Web Server (IIS)**, then click **Next**.
6. Choose any additional features, if necessary, then click **Next**.
7. Click **Next**.
8. Choose the IIS role services to install. Click **Next** to accept the defaults.
9. Confirm your selections, then click **Install**.
10. Click **Close** to exit the wizard.

To verify the web server is running, enter the following in a web browser on the web server host machine:

```
http://localhost
```

During installation, the FileMaker Server installer checks whether any existing website is using ports 80 or 443 (the Default Web Site uses port 80 and is enabled when your first enable IIS). If these ports are in use, the installer prompts you to let it stop the website or to specify alternative ports. Then, the installer creates its own separate website named FMWebSite and configures it to use the ports you specify for HTTP and HTTPS. On the master machine, the installer also configures FMWebSite to use port 16000 for Admin Console via HTTPS.

For more information about IIS, see the Microsoft website.

Setting up authentication for FMWebSite in IIS

FileMaker Server handles the authentication for password-protected databases that are published via Custom Web Publishing. You can choose whether you want to use IIS website authentication for the FMWebSite site in addition to FileMaker Server authentication.

You can choose from the following configurations:

- **Disable IIS authentication**. You can disable all IIS authentication methods and use anonymous access to the FMWebSite site. This is the simplest configuration. See the next section, “Disabling IIS authentication.”
- **Leave IIS authentication enabled and also enable Basic Authentication**. You can leave the current IIS authentication methods enabled for use with other websites, and use Basic Authentication for the FMWebSite site used by the Web Publishing Engine. You must also set up Windows user accounts that exactly match the user accounts for the web-published FileMaker databases. See “Enabling IIS authentication” on page 74.

Disabling IIS authentication

By default, Windows IIS directory security attempts to authenticate all requests that are made through the IIS web server. The simplest way to use IIS with FileMaker Server is to disable IIS authentication. If you disable all IIS authentication methods and use anonymous access to FMWebSite, then you don’t need to add any Windows user accounts.

To disable IIS authentication:

1. In Control Panel, choose **System and Security** > **Administrative Tools** > **Internet Information Services (IIS) Manager**.
2. In Internet Information Services (IIS) Manager, select the **FMWebSite** site. You may have to expand some of the nodes to see the websites.
3. In the center pane, double-click **Authentication**.
4. In the Authentication pane, do the following:
   - Ensure that **Anonymous Authentication** is enabled.
   - Disable all other authentication methods.

Enabling IIS authentication

If you enable any of the IIS authentication methods for the IIS web server, you must enable Basic Authentication for the FMWebSite site, which connects to the Web Publishing Engine. The Web Publishing Engine uses only Basic Authentication. Other websites on the web server can use the other IIS authentication methods.

In this configuration, you must also create Windows user accounts on the web server host machine that contain user names and passwords. These user names and passwords must exactly match the user names and passwords for all password-protected accounts defined in all FileMaker databases that are published via Custom Web Publishing.

The following steps show how to install Basic Authentication in each supported version of Windows and then how to enable authentication.

To install IIS Basic Authentication in Windows 8:

1. In Control Panel, choose **Programs** > **Turn Windows features on or off**.
2. Select **Internet Information Services** > **World Wide Web Services** > **Security**. Ensure that **Basic Authentication** is selected, then click **OK**.

To install IIS Basic Authentication in Windows Server 2008 R2:

1. Click the **Start** button > **Administrative Tools** > **Server Manager**.
2. Click **Add Roles**.
3. In the Add Roles wizard, select **Web Server (IIS)**, then click **Next**.
4. Select **Web Server** > **Security**. Ensure that **Basic Authentication** is selected.
5. Click **Next** until you reach the end of wizard, then click **Close**.

To install IIS Basic Authentication in Windows Server 2012 R2:

1. On the Windows Start screen, choose **Server Manager**.
2. Choose **Manage** menu > **Add Roles and Features**.
3. Select **Role-based or feature-based installation**, then click **Next**.
4. Select the server, then click **Next**.
5. Choose **Web Server (IIS)**, then click **Next**.
6. Choose any additional features, if necessary, then click **Next**.
7. Click **Next**.
8. Select **Web Server** > **Security**. Ensure that **Basic Authentication** is selected.
9. Click **Next** until you reach the end of wizard, then click **Close**.

To enable IIS authentication:

1. In Control Panel, choose **System and Security** > **Administrative Tools** > **Internet Information Services (IIS) Manager**.
2. In Internet Information Services (IIS) Manager, select the **FMWebSite** site. You may have to expand some of the nodes to see the websites.
3. In the center pane, double-click **Authentication**.

4. In the Authentication pane, do the following:
   - Enable **Anonymous Authentication**.
   - Enable **Basic Authentication**.
5. Click **OK**.

Using the Apache web server in OS X

You do not need to enable the Apache web server that is installed with OS X, nor do you need to have the OS X Server application installed. In fact, the FileMaker Server installer creates its own instance of the Apache web server on both the master and worker machines and configures this web server to use port 80 for HTTP and port 443 for HTTPS (or the alternative ports you specify); on the master machine, the installer also configures its Apache web server to use port 16000 for Admin Console via HTTPS. If you have enabled the Apache web server that is already installed with OS X, the FileMaker Server installer prompts you to let it disable any existing website using port 80 or 443, or to specify alternative ports, before it can continue.

If you have the OS X Server application installed and use it to enable any HTTP services (for example, websites or the wiki), the existing Apache instance may be re-enabled after FileMaker Server is installed. Therefore to ensure the Apache instance used by FileMaker Server works normally, you may need to configure any other HTTP services to use different ports from the ports that FileMaker Server uses, disable other HTTP services, or uninstall the OS X Server application.

Chapter 8
Optimizing your FileMaker Server deployment

FileMaker Server must be properly installed, maintained and configured so that users can efficiently perform the tasks they need. This chapter provides tips on selecting the proper hardware, configuring the operating system, identifying issues that help FileMaker Server run efficiently, and monitoring the server's performance. If your company has an IT group, they might be able to provide support and guidance to keep the server running efficiently.

Selecting the right hardware

Before you select hardware for the server, consider how many users are or will be accessing the server. If many users are accessing the database, then the hard drive and processor will probably get heavy usage. A Database Server accessing a great deal of data can take more resources and needs the right equipment.

Consider these key areas when selecting the hardware:

- **Disk subsystem.** The disk subsystem is a type of disk storage that has an integrated collection of disk drives. This subsystem is the most important factor to consider when purchasing hardware for FileMaker Server because it reads and writes data stored in the database. Having a fast and optimized disk subsystem to effectively handle both reading and writing the data has a significant impact on how the database performs. Regardless of the specific drive type you selected, configure the subsystem to support a Redundant Array of Inexpensive Disks (RAID) or reliable Storage Area Network (SAN) for the hosted databases.
- **Processor.** FileMaker Server handles many processor intensive operations, such as finding information, evaluating unstored calculations, and resolving relationships; therefore, the processor you choose is almost as important as the disk subsystem. Because FileMaker Server can take advantage of multiple processors, certain database tasks can be handled by different processors.
- **Network.** The network throughput can be measured using various tools on the system, and the quality of network throughput depends on several factors. These include the type of Network Interface Card (NIC) installed and the network's physical infrastructure. While the network infrastructure may be outside your control, problems happen due to the network configuration, traffic, and routing. Users can connect to and work with databases over a LAN or a WAN connection. Connecting to a FileMaker Server hosted database over the Internet or a WAN requires that several ports be open for TCP.

- **Memory.** The amount of memory a database uses depends on the size of the database, the type of database, the number of users, and the database's complexity. Any one of these factors can require more memory. Another critical factor for FileMaker Server is the cache.

  The maximum allowed database RAM cache size is the smaller positive number of these two formulas:

  - the physical RAM size minus 1024 MB (1 GB)
  - 90% of the physical RAM size

  If Web Publishing is enabled in a single-machine configuration, you should set the database cache to no more than 50% of the maximum.

  You specify the database cache size by selecting the **Database Server** > **Databases** tab in Admin Console.

Note During deployment, FileMaker Server configures memory use based on the physical RAM size. If you add or remove RAM, you need to redeploy so that FileMaker Server can recalculate optimal memory use for its components.

Virtual servers

Virtualization lets you run multiple instances of an operating system and its specific applications or services on the same physical hardware because you can use a software application to divide a server into isolated virtual environments. Some IT departments turn to virtualization to reduce costs and as a way to use the full potential of the hardware.

FileMaker Server has been tested to run in virtual machines. When using FileMaker Server within a virtualized environment, you must monitor the machines to determine the stress being placed upon the physical hardware.

Setting up and configuring the operating system

Keeping the server running reliably and efficiently takes some planning. You have to set up and configure the operating system, either in Windows or OS X, to avoid problems on the chosen operating system.

Setting up and configuring Windows

If you are running FileMaker Server in Windows, this table provides suggestions for setting up and configuring the operating system.

Recommendation	Do this
Update the operating system and other key drivers	Make sure the BIOS, firmware, and drivers are updated, including: ▪ Machine BIOS/Firmware ▪ Disk Controllers, including RAID Controllers ▪ Disk drives ▪ Network Interface Cards (NICs) ▪ Display adapters
Install Windows updates	Check for the latest service patches and updates and install them. Check http://www.filemaker.com/r/fms-specs for supported Windows versions and service packs.

Recommendation	Do this
Configure the disk subsystem	Configure the disk array into three logical partitions. ▪ On the first partition, install the operating system and FileMaker Server. ▪ On the second partition, store the databases that FileMaker Server will host. ▪ On the last partition, store local backup files and performance logs.
Don't use file sharing	FileMaker Server's database server accesses the FileMaker database files directly and handles the network access by FileMaker clients. File sharing is not needed.
Disable unnecessary services	Disable services that Windows enables by default that FileMaker Server doesn't need to function properly. The FileMaker Server service only needs to access the hard drives and network.
Disable other Windows settings	Consider changing these settings when optimizing the system on which FileMaker Server is going to run: ▪ Disable **Disk Indexing** for the hosted database volume and the backup volume. ▪ Disable **Shadow Copy** (sometimes referred to as Volume Snapshot Service or VSS) on the hosted database volume. ▪ Make the virtual memory swap file a static size so Windows doesn't attempt to adjust it. Using the recommended file size amount works fine.
Configure the Windows firewall	Find out which ports need to be open and configure the firewall on the master and worker machines. For more information, see "Before you begin" on page 9 or "Before you begin installing on multiple machines" on page 25.
Configure virus scanning	Do not allow anti-virus software to scan the folders that contain hosted database files or the folders that contain files for container fields that store data externally. Anti-virus software may cause file corruption if you allow real-time or on-access virus scanning while files are being hosted to users. With real-time scanning, the virus scanner may spend large amounts of time scanning the database files. This scanning places a heavy load on the server's disk, memory, and processor.
Defragment the hard drive	Defragment the hard drive partition containing the live database files (not the backups) routinely; however, don't defragment the partition while files are being hosted. Note Close any live hosted files with Admin Console before defragmenting. For more information about how to close a file, see FileMaker Server Help.

Setting up and configuring OS X

This table provides specific tips for the settings and configurations for FileMaker Server in OS X.

Recommendation	Do this
Avoid services that may impact the live, hosted database	Any service or application that allows the live, hosted database files to be touched, copied, or accessed in any way may cause database corruption. Sometimes files accessed directly while FileMaker Server is under load become corrupted. If you remove the process that accesses the files, then they are no longer corrupted. Avoid those services or applications that attempt to access the hosted files.
Don't use file sharing	FileMaker Server's database server accesses the FileMaker database files directly and manages the network access by FileMaker clients. File sharing is not needed.
Turn off OS X Spotlight	Spotlight indexing can impact FileMaker Server's performance. The Spotlight service automatically watches when information is written to the hard drive and indexes the data to allow faster searches for files.
Don't use Time Machine	Time Machine is an application that automatically backs up files, but doesn't back up any files that are in use, such as the live FileMaker database files. If you use Time Machine, it doesn't corrupt the database files if it was configured to back up those files, but can be very CPU intensive. You should add the locations where the databases are stored to the "Do not back up" section of the Time Machine Preferences to avoid problems.

Recommendation	Do this
Don't enable FileVault	FileVault is used to encrypt the entire OS X startup volume. Don't enable FileVault on your FileMaker Server machine. This requires an additional layer of software and more processor work on any data being moved to or from the hard drive. Instead, use FileMaker Pro Advanced to encrypt databases. See "Encrypting databases" on page 54.
Make sure the Dashboard is not running	The OS X Dashboard allows small applications, called *widgets*, to run. Log out or exit Dashboard. (Dashboard does quit when the user logs out.) By not running Dashboard, server resources are not consumed with running widgets.
Configure the firewall	The OS X firewall is disabled by default. You can enable the firewall by opening the System Preferences application. Configure the firewall to allow incoming connections to FileMaker Server. When FileMaker Server is initially deployed, OS X does ask whether the FileMaker Server component is allowed to accept incoming connections.
Disk Permissions and S.M.A.R.T. Status	Because OS X is built on UNIX, the underlying permissions for hosted database files are sometimes set incorrectly. Although the database files are placed in the right location, they can be inaccessible because FileMaker Server can't modify the permissions. Use FileMaker Pro to upload the database file and to properly set the file permissions. For more information, see FileMaker Server Help.
Security	By default when a computer running OS X starts, it immediately opens to the desktop. FileMaker Server doesn't require anyone to be logged in for it to run.
Configure virus scanning	Do not allow anti-virus software to scan the folders that contain hosted database files or the folders that contain files for container fields that store data externally. Anti-virus software may cause file corruption if you allow real-time or on-access virus scanning while files are being hosted to users. With real-time scanning, the virus scanner may spend large amounts of time scanning the database files. This scanning places a heavy load on the server's disk, memory, and processor.

Monitoring FileMaker Server

Monitoring the server is important for recognizing and preventing problems.

- When users report a problem, such as a system crash or very slow performance, you need good monitoring tools to determine what caused the problem.
- By analyzing future hardware needs, taking baseline readings when monitoring a situation, or gaining a better understanding of the server's health, you can prevent future problems.

Monitoring performance in Windows

To monitor FileMaker Server in Windows, you can use a tool called Performance Monitor, also known as *perfmon*. With the perfmon tool, you can examine how applications that are running affect your computer's performance, including the memory used, disk access time, and log statistics on different processes. While some log information shows obvious bottlenecks or stress points, much of the information might require more detailed analysis. With a little experience, you can recognize common stress points.

Note To use perfmon, you must have local Administrators group or equivalent privileges in Windows. For more information about using perfmon, see Windows Help and Support.

There are five logs that can help you monitor performance in Windows:

- **Processor.** Logs the processor activity and idle times. Select **% Processor Time** as the primary indicator of processor activity and to display the average percentage of busy time. To view the time the processor is idle, select **% Idle Time**.

- **Network Interface Counter (NIC).** Captures bytes sent and received over each network adapter, the length of the output packet queue (in packets), and the errors for inbound and outbound packets.
- **Memory.** Records the amount of physical memory immediately available for allocation to a process or for system use. The log also records the Cache Bytes for Memory\System Cache, cache faults, page faults, the number of read operations, and the pages written to disk.
- **Process.** Logs statistics on processes, including time, reading and writing rate, page faults, thread count, virtual address space, and the current size, in bytes, of the memory that this process has allocated.
- **Disk.** Captures the disk read time, the disk write time, the percentage of time the disk was idle, the number of outstanding requests, and the split input and output to the disk.

Note The Windows Event Viewer contains the Application log and the System log, which are useful for understanding how the server is performing. These can provide insight into activity at the user, system, and service level.

Reviewing the performance logs

By default the performance logs show you real time statistics of specific counters. To display the performance logs, open **Administrative Tools** > **Performance Monitor**, then navigate to **Monitoring Tools** > **Performance Monitor**.

Monitoring performance in OS X

Monitoring is an important part of any server deployment; FileMaker Server is no exception. The reasons for performing monitoring are planning, resource management, and troubleshooting. OS X has four primary tools that you can use for monitoring server performance: Activity Monitor, the OS X Server application, Top, and System Activity Reporter (SAR).

- Activity Monitor is found in the /Applications/Utilities folder. It supplies a list of all the processes currently running as well as some information about the overall activity on the computer.
- The OS X Server application available in the Mac App Store provides tools that can be used to administer various services on the operating system and provide a graphical interface for monitoring CPU usage, network traffic, and memory usage. However, be aware of possible conflicts when using OS X Server to enable any HTTP Services (see “Using the Apache web server in OS X” on page 76).
- Top is a command-line program that is part of the UNIX engine for OS X. When running Top, you see a list of the processes that are running on the machine sorted by the process ID.
- SAR is a command-line program installed in OS X by default. It consists of two basic tools, the System Activity Data Collector (SADC) and the System Activity Reporter (sar). It is designed to automatically gather data for an extended time period, then analyze that data later. The data collected by SAR are reports on cumulative statistics counters.

For more information about Activity Monitor and OS X Server, see Help Center. To get information about command-line tools, open the Terminal application and look at the manual (man page). Terminal is located in the /Applications/Utilities folder. To view the man page, type `man` followed by the command—for example, `man top`.

Chapter 9
Using a standby server

A standby server is a redundant FileMaker Server installation that can be brought online to replace the primary server. If a hardware or software failure prevents the primary server from hosting databases, you can make the standby server your production server. You can also make the standby server your production server when you want to make scheduled hardware or software upgrades to the primary server.

A standby server is essentially a copy of the primary server, set up so that any changes to the primary server are automatically applied to the standby server. The standby server does not host databases for clients, but is ready to replace the primary server when needed.

When you create the connection between the primary server and the standby server, the database files and external container field objects are securely synchronized from the primary server to the standby server. Any subsequent changes to the primary server databases are saved to progressive backup files, which are incrementally applied to the standby server.

Important Using a standby server is not a replacement for backing up your hosted databases. Although you can use a standby server to recover from potential hardware or software failures, a standby server is not a substitute for a sensible backup and recovery strategy. For information on backing up your databases, see “Backing up databases” on page 55.

Standby server requirements

To set up a standby server, you must have two server machines with identical configurations. The two server machines must match in the following ways:

- Operating system (Windows or OS X) and operating system version
- FileMaker Server version
- FileMaker Server installation folder
- FileMaker Server user account name
- FileMaker Server login credentials
- Physical memory size available on the machine (RAM size)
- Deployment configuration (one-machine or two-machine deployment)
- Ports for web connections (HTTP) and secure web connections (HTTPS)
- Whether ODBC/JDBC is enabled
- Whether web publishing is enabled
- Folders containing files for container fields that store data externally
- Default database folder path
- Additional database folder paths
- Local volumes that contain databases

- Progressive backup folder path
- The setting **Enable progressive backups** must be enabled on both the primary server and the prospective standby server
- The FileMaker Server user account must have write permission to the parent folder of the progressive backup folder path

Notes

- If your installation uses remote volumes for additional database or container data folders, make sure the remote volumes are available before using any of the standby commands. To verify a folder is accessible, use the `fmsadmin list files` command.
- If you are using a container data folder to store container field data externally, be sure to select the corresponding setting to backup the container data folder. For example, if you select the **Enable container data folder 1** setting, then select the **Back up container data folder 1** setting as well. The standby server feature uses progressive backups to copy data, and the backups must include the external container data.

Standby server procedures

The procedures in this section describe how to set up and use a standby server configuration.

To complete these procedures, you must use the FileMaker Server command line interface (see “Using the command line interface” on page 61).

Windows: To run standby commands, open the command prompt window using **Run as Administrator**.

Setting up a standby server

This procedure assumes that you have a FileMaker Server single-machine installation already in production. From the production server, you must be able to open Admin Console and open and close database files. That production server will be your primary server.

To set up a standby server for your primary server:

1. Install FileMaker Server on the prospective standby server. During deployment, enter the user name, organization, and license key information that you used for the primary server.
2. Make sure that the prospective standby server configuration matches your primary server configuration. See “Standby server requirements” on page 82. Even though the prospective standby reports a license conflict, you can use Admin Console to configure the settings.
3. Close all databases on the primary server and the prospective standby server.
4. Manually copy the contents of the scripts folder from the primary server to the prospective standby server:
   - In a Windows default installation, copy the \Program Files\FileMaker\FileMaker Server\Data\Scripts\ folder.
   - On OS X, copy the /Library/FileMaker Server/Data/Scripts/ folder.

5. On the primary server, initiate a connection with the standby server using the `standby connect` command:

   ```
   fmsadmin standby connect standbyhost
   ```

   where *`standbyhost`* is the IP address or host name of the prospective standby server. If you use the host name, the host name must resolve to a single IP address.

6. Enter the user name and password for the Admin Console account that is defined on the primary server.

7. Note the setup code that FileMaker Server returns. In the next step, you will enter this setup code on the standby server. This setup code is valid for one hour.

8. On the standby server, confirm the connection with the primary server using the `standby accept` command:

   ```
   fmsadmin standby accept code
   ```

   where *`code`* is the setup code that FileMaker Server returned from the `standby connect` command in the previous step.

9. Enter the user name and password for the Admin Console account that is defined on the standby server.

10. On the primary server, complete the connection by responding to the command line prompt. You should see a message that the configuration settings have been transferred to the standby server.

11. Perform the initial file synchronization from the primary server to the standby server. On the primary server, run the `standby update` command:

    ```
    fmsadmin standby update
    ```

    By running the `standby update` command with no arguments, all hosted database files and folders that are hosted on the primary server are updated on the standby server.

12. On the primary server, open the databases that you want to host. As clients use the hosted databases, any changes are written to progressive backup files, which are used to asynchronously transfer incremental file changes to the standby server.

Notes

- If a database file is on both the primary server and the standby server when you run the `standby connect` command, the files must be identical or else the command returns an error.

  For example, if your files are on a remote volume and the volume changes the folder timestamp or dates, then FileMaker Server may determine that the files are not identical and the standby connection command returns an error.

  To waive this requirement, use the `--overwrite` option. When this option is used, conflicting databases on the standby server are overwritten when they are updated. Databases that are on the standby server but not on the primary server are not changed.
- When the standby server is initially connected to the primary server, the primary server's license key is transferred to the standby server. If you change the license key on the primary server, the license key is also updated on the standby server.

- After you have defined the standby configuration, do not change the FileMaker Server user account. Changes to the FileMaker Server user account may cause the `standby switchover` command to fail.
- After you have defined the standby configuration, database files synchronize from the primary server to the standby server when they are first opened on the primary server. Opening database files on a primary server may take longer than on a standalone server because the files are synchronized to the standby server before they are opened on the primary server.
- The following folders are synchronized from the primary server to the standby server:
  - Data/Database folder. If you define additional database folders—additional database folder 1 or additional database folder 2—they are also synchronized.
  - Data/Databases/RC_Data_FMS folder, as long as this folder is not a shared network folder such as a SAN target. If you define additional container data folders—container data folder 1 or container data folder 2—they are also synchronized.
  - CStore folder. However, for security reasons, custom SSL certificates are not copied.
- The contents of other folders—for example, the extensions, scripts, documents, backup, and HTTPServer folders—are not automatically copied to the standby server. You may either manually copy the folders' contents or use the `standby update` command. See "Updating files and folders on the standby server" on page 90.
- When files are copied from the primary server to the standby server, file attributes are not retained. For example, even if a file is locked on the primary server, it will be unlocked on the standby server because the "locked" attribute is not retained when the file is copied. Use FileMaker accounts and privilege sets to secure the database file rather than using the system's file attributes to lock the file.
- If a database is removed from the primary server, the database is not automatically removed from the standby server.
- Once you define a server as a standby server, you cannot configure the standby server's settings directly. Changes that you make to the primary server's configuration settings are saved on the primary server, and are not transferred to the standby server until a switchover procedure (described in "Switching the standby configuration roles") or failover procedure (described in "Using the standby server when the primary server fails" on page 87).

  For security reasons, the settings **Use SSL for database connections** and **Use SSL for progressive downloading** are not transferred from the primary server to the standby server. Install a custom SSL certificate and configure these settings on the prospective standby server before running the standby connect command.

  In addition, the settings on the following Admin Console tabs cannot be transferred from the primary server to the standby server:

  - **General Settings** > **ODBC/JDBC**
  - **Web Publishing** > **General Settings**
  - **Web Publishing** > **FileMaker WebDirect**
  - **Web Publishing** > **PHP**
  - **Web Publishing** > **XML**

  To change these settings, disconnect the standby server, change the settings on both servers, and then reconnect the standby server.

- If you installed FileMaker Server on the prospective standby server and opened Admin Console on that machine before opening Admin Console on the primary server, you may receive a license conflict on the primary server that prevents it from acting as the primary server. To resolve this issue:
  - On the prospective standby server, stop FileMaker Server either using Admin Console or the CLI command `fmsadmin stop server`.
  - On the primary server, restart FileMaker Server either using Admin Console or the CLI command `fmsadmin restart server`.
  - On the prospective standby server, start FileMaker Server either using Admin Console or the CLI command `fmsadmin start server`.
  - Follow the procedure described in “Setting up a standby server” on page 83.

Switching the standby configuration roles

When you switch the roles of your primary server and your standby server, you make the standby server your production server and the primary server becomes the standby server. This procedure is called a *switchover*.

Important Running the `standby switchover` command while clients are connected to databases or while scripts are running can cause data loss. Any uncommitted data is lost when you run the `standby switchover` command. Notify clients about a planned switchover in advance, and perform the switchover operation at off-peak times when clients are not connected.

To perform a switchover operation:

1. On the primary server, use the `standby status` command to verify all files:

   ```
   fmsadmin standby status -s
   ```

   Fix any issues that are reported before continuing with the rest of this procedure.

2. On the primary server, use the `pause` command to pause all open databases.

   ```
   fmsadmin pause
   ```

3. On the primary server, use the `standby update` command to update all databases from the primary server to the standby server:

   ```
   fmsadmin standby update
   ```

4. On the primary server, run the `standby switchover` command:

   ```
   fmsadmin standby switchover
   ```

5. After you run the `standby switchover` command, the former standby server becomes the new primary server. On the new primary server, use the `resume` command to resume all paused databases.

   ```
   fmsadmin resume
   ```

Notes

When you run the `standby switchover` command on the primary server:

- The primary server pauses all hosted databases and sends all pending progressive backup files to the standby server.

  Note Only the databases that have been opened on the primary server are synchronized with the standby server. Databases that have never been opened on the primary server are not copied to the standby server, even if those databases are in one of the database folders on the primary server. If you want to copy all the files in a database folder, use the `standby update` command and specify the folder you want to copy. See “Updating files and folders on the standby server” on page 90.

- The standby server applies all the pending progressive backup files that it has received, and then the standby server becomes the production server.
- The former primary server becomes the new standby server.
- In general, hosted databases are resumed for clients to use. However, use Admin Console or CLI commands to verify that databases are open after the switchover operation completes. If the former primary server hosted encrypted database files, the encrypted database files do not automatically open after you switch the roles of your primary and standby servers. You must manually open encrypted database files after completing the switchover. See “Opening encrypted databases” on page 55.

Note If the primary server is unable to communicate with the standby server, the switchover operation fails, and the primary server remains the production server.

Using the standby server when the primary server fails

If your primary server fails due to a hardware or software issue, or if the primary server becomes unavailable due to network issues, you can make your standby server the production server in place of the primary server. This procedure is called a *failover*.

To perform a failover operation, run this command on the standby server:

```
standby disconnect command
```

When you run the `standby disconnect` command on the standby server:

- The standby server is changed to a standalone server and stops synchronizing with the primary server.
- Because the standby server is no longer communicating with its former primary server, the standby server does not attempt to change the former primary server to a standalone server. It only changes itself to a standalone server. However, if the former primary server is able to communicate with the former standby server and detects that the former standby server is now a standalone server, the former primary server changes itself to a standalone server as well.
- There may be some data loss if the primary server had not fully synchronized with the standby server before the primary server failed.

Important Do not to bring both database servers online after the standby server has switched to a standalone server. When the same database files are simultaneously hosted by two servers, clients may unknowingly commit data to separate copies of the database files.

Setting primary and standby server host names

To minimize the impact to clients, use alias host names instead of direct IP addresses for the primary server and the standby server. By planning the host names for each server, you can make it easier for clients to connect to the production server after switchover and failover operations.

Use the `standby hostnames` command to set the host names that FileMaker clients use to access hosted databases. On the primary server, run this command:

```
fmsadmin standby hostnames primaryHost standbyHost [options]
```

where *`primaryHost`* is the host name for the primary server and *`standbyHost`* is the host name for the standby server. For `options`, you can use `-w` or `--wait` to set the timeout value.

A network administrator needs to configure the environment's Domain Name System (DNS) to resolve a server host name to both the primary server and standby server addresses.

Disconnecting a standby server

To disconnect a standby server from the primary server:

1. On the primary server, use the `pause` command to pause all open databases.

   ```
   fmsadmin pause
   ```

2. On the primary server, use the `standby update` command to update all databases from the primary server to the standby server:

   ```
   fmsadmin standby update
   ```

3. On the primary server, use the `standby disconnect` command:

   ```
   fmsadmin standby disconnect
   ```

4. On the primary server, use the `resume` command to resume all paused databases.

   ```
   fmsadmin resume
   ```

When you run the `standby disconnect` command on the primary server:

- The primary server removes the standby server from synchronization, then the primary server is changed to a standalone server. The primary server does not need to be restarted after it is changed to a standalone server. Clients can continue to use hosted databases after you resume the paused databases.
- The standby server is removed from synchronization, then the standby server is changed to a standalone server. To prevent both servers from hosting the same databases, the databases on the former standby server are closed, and the **Automatically Open Database Files** setting is disabled on the former standby server.
- If the primary server cannot communicate with the standby server, the primary server still changes to a standalone server and stops sending updates to the standby server. However, the standby server remains as a standby server due to the communication error. To complete the disconnection, run the `standby disconnect` command on the standby server, and the standby server is changed to a standalone server.

Reconnecting a standby server

If you want to reconnect servers that you previously disconnected:

1. Ensure that the prospective primary server is a standalone server by running the `standby status` command, described in “Getting information about the standby configuration” on page 91.
   - If you see the message “Standby server not configured,” then the server is a standalone server.
   - If you see a message that says the server is a primary or a standby server, then run the `standby disconnect` command to change it to a standalone server.
2. Ensure that the prospective standby server is a standalone server by running the `standby status` command, described in “Getting information about the standby configuration” on page 91.
   - If you see the message “Standby server not configured,” then the server is a standalone server.
   - If you see a message that says the server is a primary or a standby server, then run the `standby disconnect` command to change it to a standalone server.
3. After verifying that both servers are standalone servers, follow the procedure described in “Setting up a standby server” on page 83.

Notes

- If a database file is on both the primary server and the standby server when you run the standby connect command, the files must be identical or else the command returns an error. When reconnecting a standby server, you can either delete conflicting databases or use the `--overwrite` option. When this option is used, conflicting databases on the standby server are overwritten when they are updated. Databases that are on the standby server but not on the primary server are not changed.
- After a failover with a two-machine configuration, you cannot use the `standby connect` command to reconnect the former standby server. To redefine the standby configuration, uninstall and then reinstall FileMaker Server from the former standby server. Then follow the steps in “Setting up a standby server” on page 82.

Updating files and folders on the standby server

In case of an update error or communication failure, you may need to update specific database files or folders. Use the `standby update` command to update files or folders on the standby server. This command can only be run on the primary server. Before running this command, close or pause all open databases using `fmsadmin close` or `fmsadmin pause`.

Format

```
fmsadmin standby update [file...] [path...][options]
```

Options

- If no file or path is specified, all databases that are open on the primary server are updated.
- For *file*, you can specify a database ID or database name to update that database file, including any external container field objects. If the specified file is already up-to-date on the standby server, no updates are transferred. You can specify multiple files, separated by spaces.
- For *path*, you can specify a directory containing database files that you want to update. You can use "*" wildcards, but UNIX regular expressions and other types of wildcards are not supported.

  Note To use "*" wildcards on OS X, enclose the value for *path* in quotation marks. For example: `fmsadmin standby update "/folder/*"`

  The standby server must be able to create the same directory as specified on the primary server. The root volume of the directory must already exist on the standby server. If the volume refers to a remote drive, the drive must be mounted before you run the `standby update` command. The FileMaker Server user account must have write access to the directory.

  The value for *path* cannot include files in reserved folders:

  - the default database folder
  - the additional database folders
  - the container data folders

  The value for *path* can include these folders:

  - Data/Backups/
  - Data/Documents/
  - Data/Scripts/
  - Extensions/
- Use the `-r` or `--recursive` option to recursively update folders.

Note To update files that use a filename extension other than .fmp12, you must register the filename extension in Admin Console on the **Database Server** > **Databases** tab before running the standby update command. See FileMaker Server Help.

Getting information about the standby configuration

You can use the `standby status` command to get information about the standby configuration of your server machines. You can run this command on a primary server, a standby server, or a standalone server that is not using a standby configuration.

Example 1: Running standby status on a primary server

```
fmsadmin standby status -u [admin] -p [pass]
```

Result

```
Primary Server: FMS01 (192.168.1.101) This machine
Standby Server: FMS02 (192.168.1.102)
Last Updated: 10-22-2014 02:55:44 PM
```

Example 2: Running standby status on the standby server

```
fmsadmin standby status -u admin -p pass
```

Result

```
Primary Server: FMS01 (192.168.1.101)
Standby Server: FMS02 (192.168.1.102) This machine
Last Updated: 10-22-2014 02:55:44 PM
```

Example 3: Running standby status on a standalone server

```
fmsadmin standby status -u admin -p pass
```

Result

```
Standby server not configured.
```

Example 4: Getting status information about updates

To get status information about the updates to individual database files, use the `-s` or `--stats` option.

```
fmsadmin standby status -u admin -p pass -s
```

Result

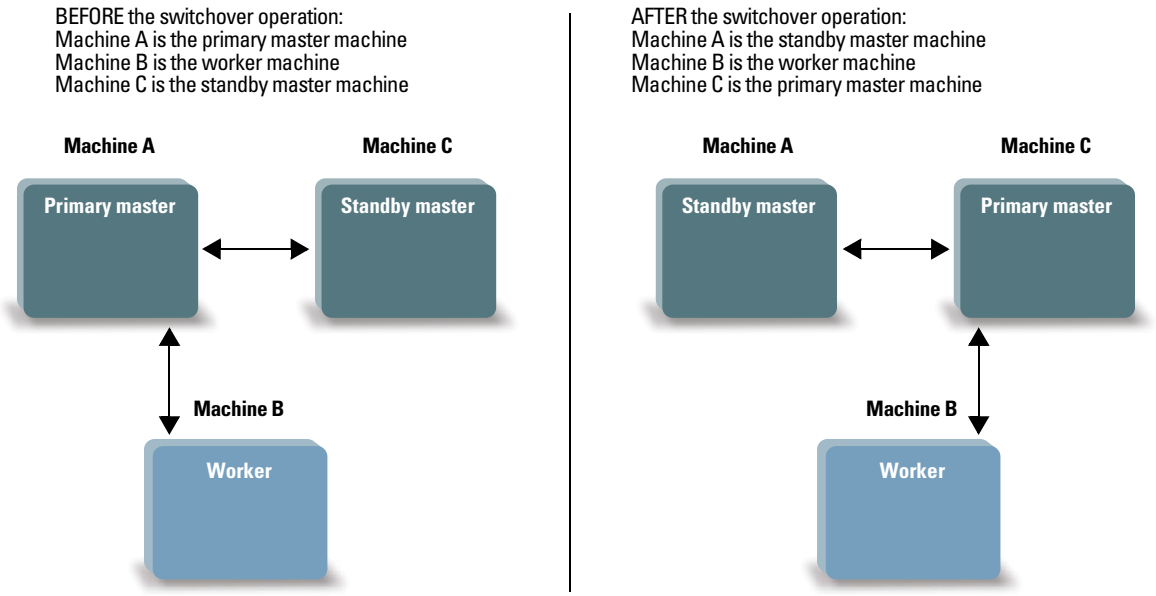
```
Primary Server: FMS01 (192.168.1.101) This machine
Standby Server: FMS02 (192.168.1.102)
Last Updated: 10-22-2014 02:55:44 PM
ID   File            State          Last Updated              Last Error
1    Contacts.fmp12  Updated        10-22-2014 02:55:44 PM
2    Invoices.fmp12  Update Error   10-21-2014 01:23:14 AM    Permission Denied
3    Orders.fmp12    Updating       10-22-2014 02:55:43 PM
4    Sales.fmp12     Not Updated
```

Using a standby server in a two-machine deployment

A two-machine deployment consists of a master machine—which runs the Database Server—and a worker machine—which runs the Web Publishing Engine, web server, and Web Server Module. For a two-machine deployment, you can set up a standby server for the master machine:

- When you install FileMaker on the prospective standby server, select **Single Machine** as the installation type.
- Follow the procedure in “Setting up a standby server” on page 83, using the master machine as the primary server.

The worker machine in the two-machine configuration communicates with the server that is the primary master machine in the standby configuration.



The worker machine automatically communicates with the primary master machine

When you perform a switchover or failover operation with a two-machine deployment, FileMaker Server automatically updates the worker machine to communicate with the correct master machine.

However, after a failover with a two-machine configuration, you cannot use the `standby connect` command to reconnect the former standby server. To redefine the standby configuration, uninstall and then reinstall FileMaker Server from the former standby server. Then follow the steps in “Setting up a standby server” on page 83.

Chapter 10
Additional resources

Product documentation

Using FileMaker Server documentation

Online Help is accessible from FileMaker Server Admin Console, **Help** menu > **FileMaker Server Help**.

Where to find PDF documentation

To access PDFs of FileMaker Server documentation:

- In Admin Console, choose **Help** menu > **FileMaker Server Product Documentation**.
- Click the links in the FileMaker Server Admin Console Start Page.
- On the web, go to http://www.filemaker.com/documentation.

Customer support

For information about Technical Support and Customer Assistance, visit http://www.filemaker.com/intl.

To access resources on the FileMaker website, such as ready-made solutions and the FileMaker Knowledge Base, open the FileMaker Server Admin Console Start Page and click **Service and Support**.

If you do not have access to the web, refer to the FileMaker Service Directory that comes with your software.

Check for software updates

From the FileMaker Server Admin Console Start Page, you can check for software updates. In the Software Update section, click **Check Now**. If an update is available, you can click a link to download the update.

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