

Dynamic content: programming the web servers

Step 1: let's install a (Apache) web server

Let's install a Web Server

We will, step by step:

1. install Apache (with a series of extra tools: DB and languages – Perl and PHP)
2. Customize it (e.g. by changing port)
3. Customize its response (static files)
4. Attack the dynamic content problem

XAMPP

<https://www.apachefriends.org/download.html>

What does XAMPP means? Generalization of WAMP, LAMP, MAMP

W = Windows, L=Linux, M=Mac, X=Anything

A = Apache Web Server

M = MySQL , MariaDB

P = PHP

P = Perl

XAMPP download

<https://www.apachefriends.org/download.html>

The screenshot shows the Apache Friends website's download section. The top navigation bar includes links for Apache Friends, Download (which is highlighted), Add-ons, Hosting, Community, and About. There is also a search bar and a language selection for English (EN). The main content area features a large heading 'Download' and a brief description of what XAMPP is. Below this, there is a table listing three versions of XAMPP for Windows: 7.2.27, 7.3.14, and 7.4.2. Each row includes a Windows icon, the version name, a 'What's Included?' link, checksums (md5 and sha1), a 'Download (64 bit)' button, and the file size.

XAMPP is an easy to install Apache distribution containing MariaDB, PHP, and Perl. Just download and start the installer. It's that easy.

This screenshot shows the specific XAMPP for Windows download page. It features a large heading 'XAMPP for Windows 7.2.27, 7.3.14 & 7.4.2'. Below it is a table with three rows, each representing a different version. The first row is for XAMPP 7.2.27 with PHP 7.2.27, the second for 7.3.14 with PHP 7.3.14, and the third for 7.4.2 with PHP 7.4.2. Each row contains a Windows logo, the version name, a 'What's Included?' link, md5 and sha1 checksums, a 'Download (64 bit)' button, and the file size (147 Mb or 148 Mb). At the bottom of the page, there are links for 'Requirements', 'Add-ons', and 'More Downloads」'. A note at the bottom states that Windows XP or 2003 are not supported and provides a link to download a compatible version for those platforms.

Documentation/FAQs

There is no real manual or handbook for XAMPP. We wrote the documentation in the form of FAQs. Have a burning question that's not answered here? Try the [Forums](#) or [Stack Overflow](#).

- [Linux FAQs](#)
- [Windows FAQs](#)
- [OS X FAQs](#)
- [OS X XAMPP-VM FAQs](#)

Add-ons and Themes



Bitnami provides a free all-in-one tool to install Drupal, Joomla!, WordPress and many other popular open source

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XAMPP download



XAMPP for Linux 7.2.27, 7.3.14 & 7.4.2

Version	Checksum	Size
7.2.27 / PHP 7.2.27	What's Included? md5 sha1	Download (64 bit) 148 Mb
7.3.14 / PHP 7.3.14	What's Included? md5 sha1	Download (64 bit) 149 Mb
7.4.2 / PHP 7.4.2	What's Included? md5 sha1	Download (64 bit) 151 Mb

[Requirements](#) [Add-ons](#) [More Downloads »](#)



XAMPP for OS X 7.2.27, 7.3.14, 7.4.2, 7.2.27, 7.3.14 & 7.4.2

Version	Checksum	Size
7.2.27 / PHP 7.2.27	What's Included? md5 sha1	Download (64 bit) 159 Mb
7.3.14 / PHP 7.3.14	What's Included? md5 sha1	Download (64 bit) 159 Mb
7.4.2 / PHP 7.4.2	What's Included? md5 sha1	Download (64 bit) 160 Mb
7.2.27 / PHP 7.2.27	What's Included? md5 sha1	Download (64 bit) 322 Mb

VM Installation (e.g. on Mac)...

LAMPP is installed on a virtual machine.

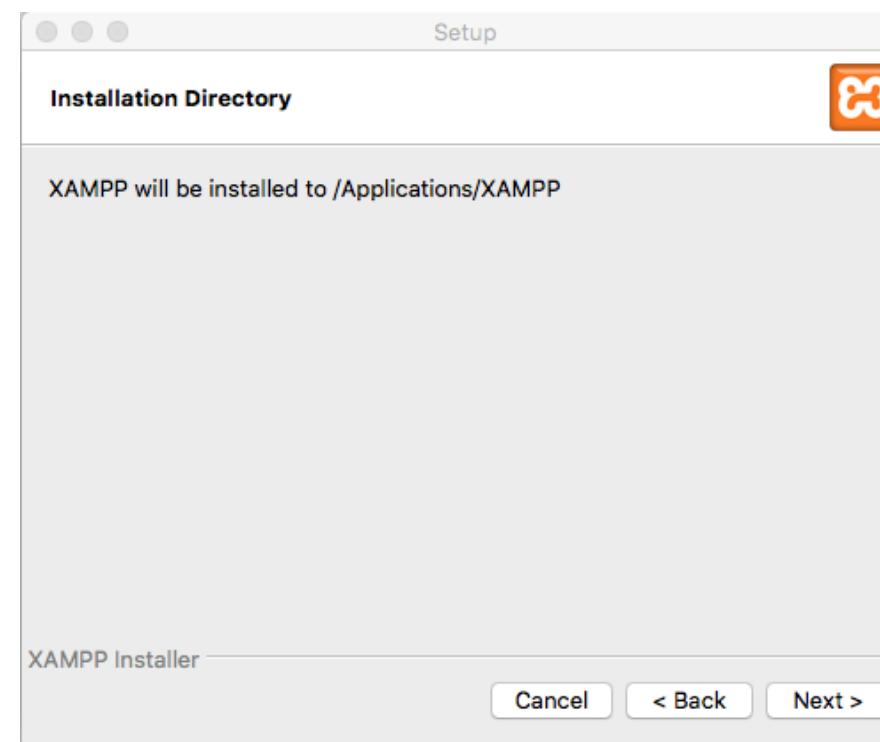
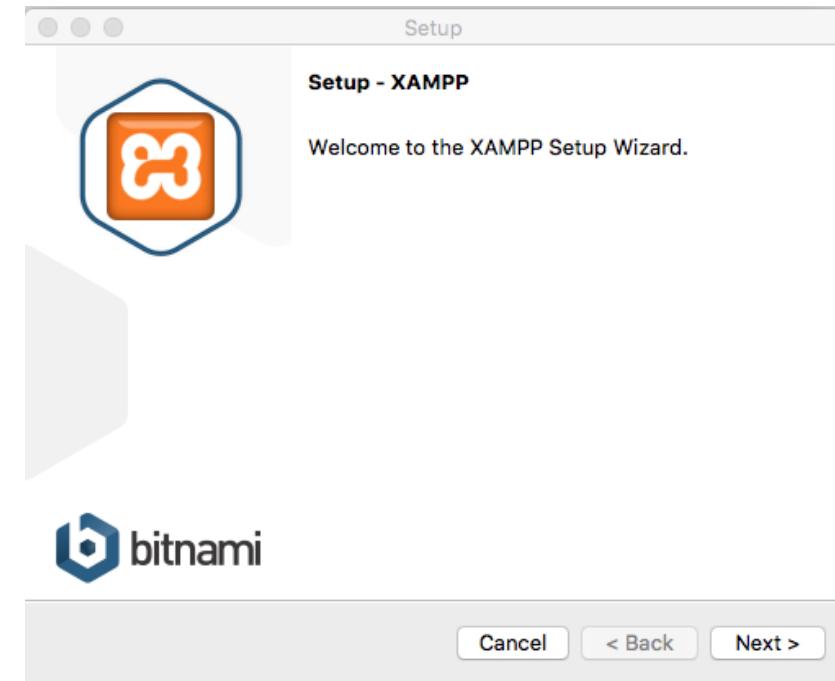
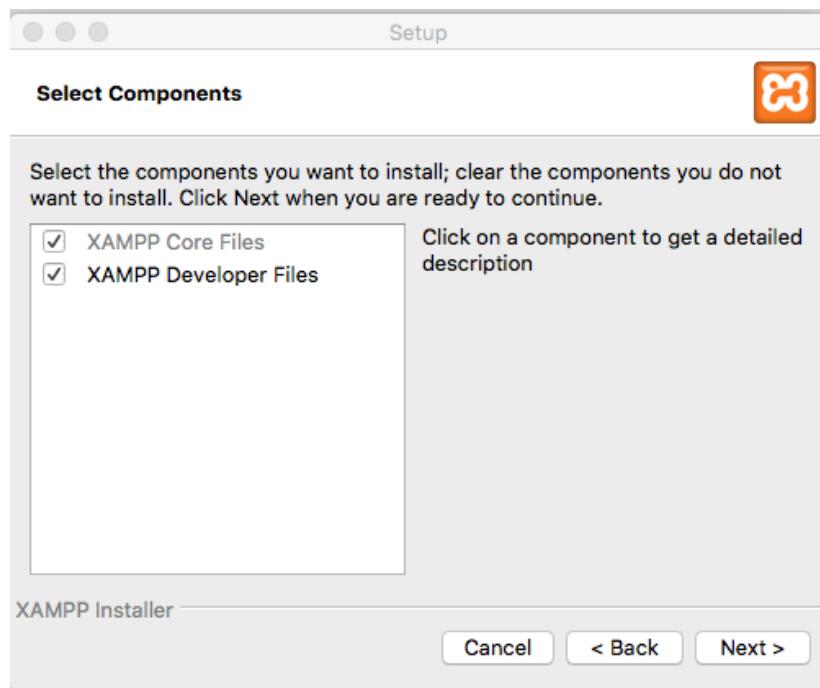
We need to:

- Connect the port on our machine (e.g. 8080) to the 80 port on the VM
- Access the VM file system from our file system

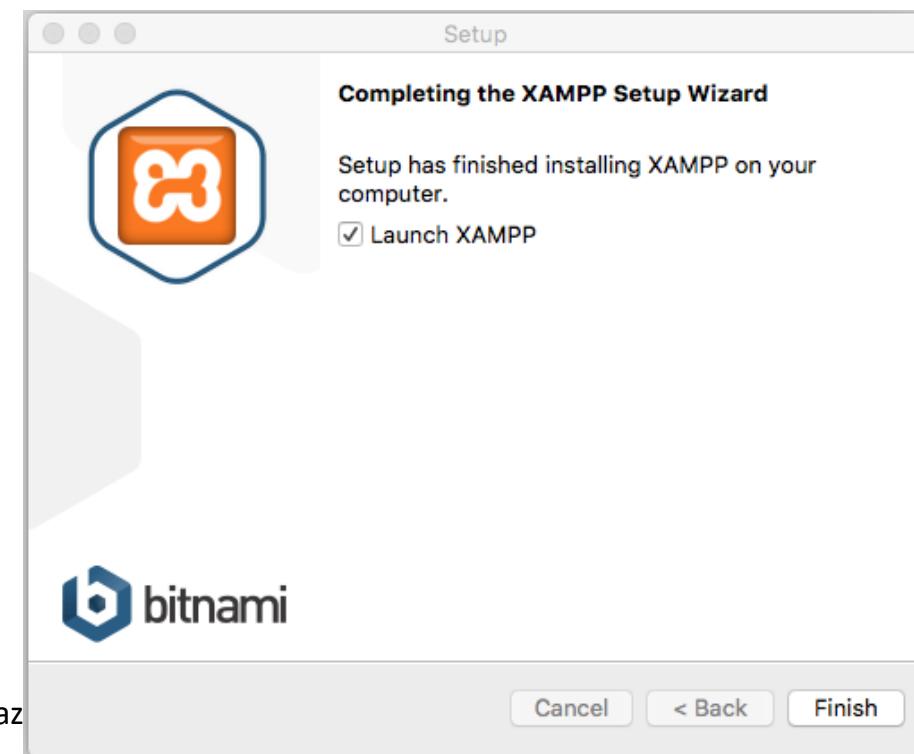
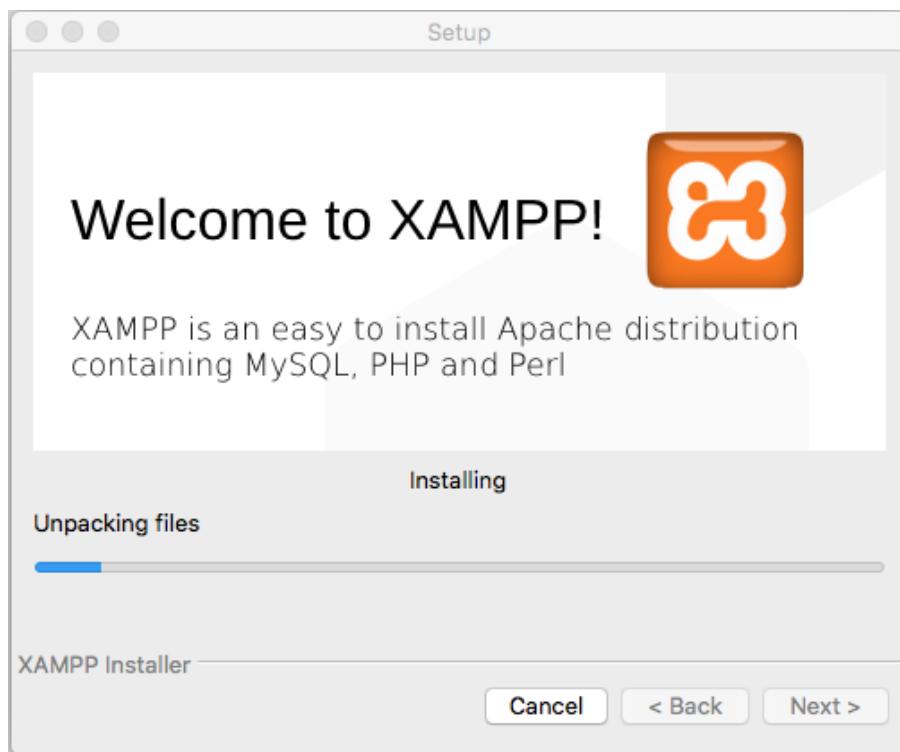
Mac users: do not use the VM version, but rather use this:

<https://sourceforge.net/projects/xampp/files/XAMPP%20Mac%20OS%20X/7.4.2/>

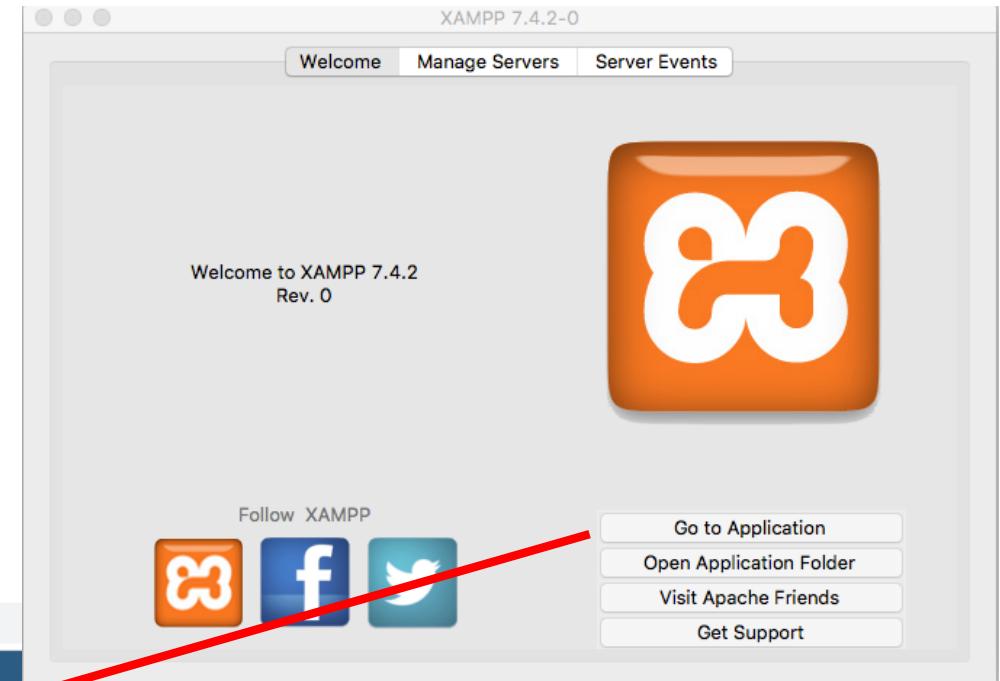
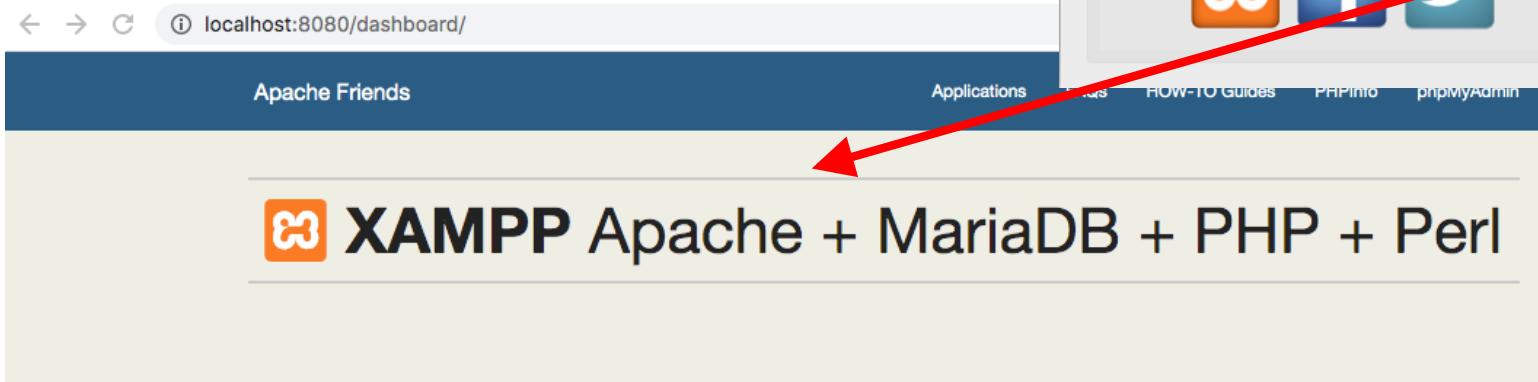
First run: setup - 1



First run: setup - 2



First run:



Welcome to XAMPP for 7.4.2-0

You have successfully installed XAMPP on this system! Now you can start using Apache, MariaDB, PHP and other components. You can find more info in the [FAQs](#) section or check the [HOW-TO Guides](#) for getting started with PHP applications.

XAMPP is meant only for development purposes. It has certain configuration settings that make it easy to develop locally but that are insecure if you want to have your installation accessible to others. If you want have your XAMPP accessible from the internet, make sure you understand the implications and you checked the [FAQs](#) to learn how to protect your site. Alternatively you can use [WAMP](#), [MAMP](#) or [LAMP](#) which are similar packages which are more suitable for production.

Start the XAMPP Control Panel to check the server status.

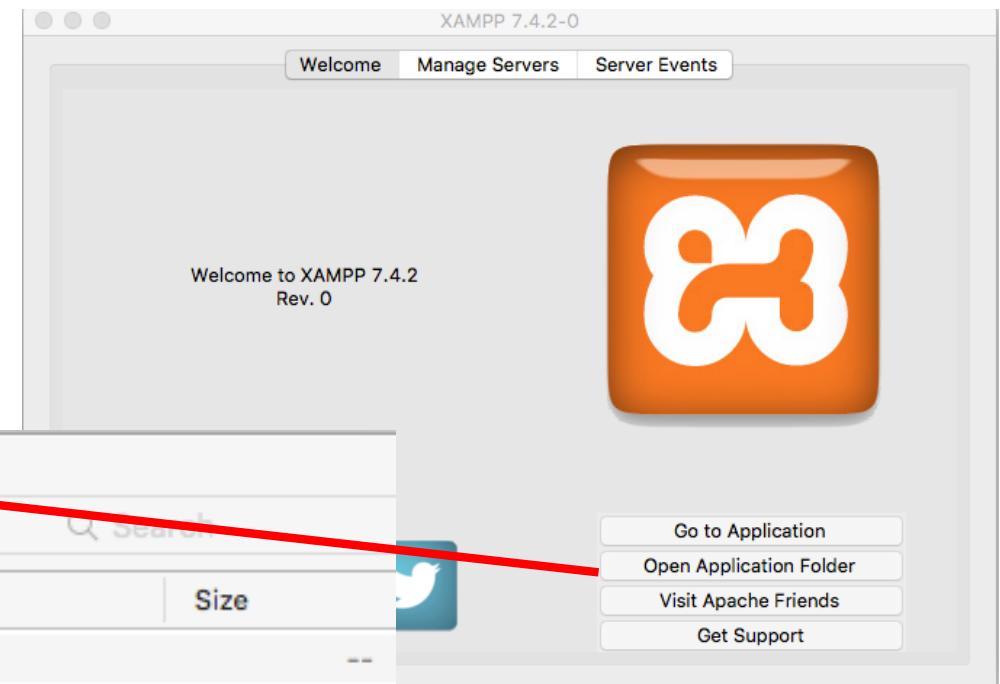
Community

XAMPP has been around for more than 10 years – there is a huge community behind it. You can get involved by joining our [Forums](#).

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XAMPP Manager:



/MacintoshHD/Applications/XAMPP/xamppfiles

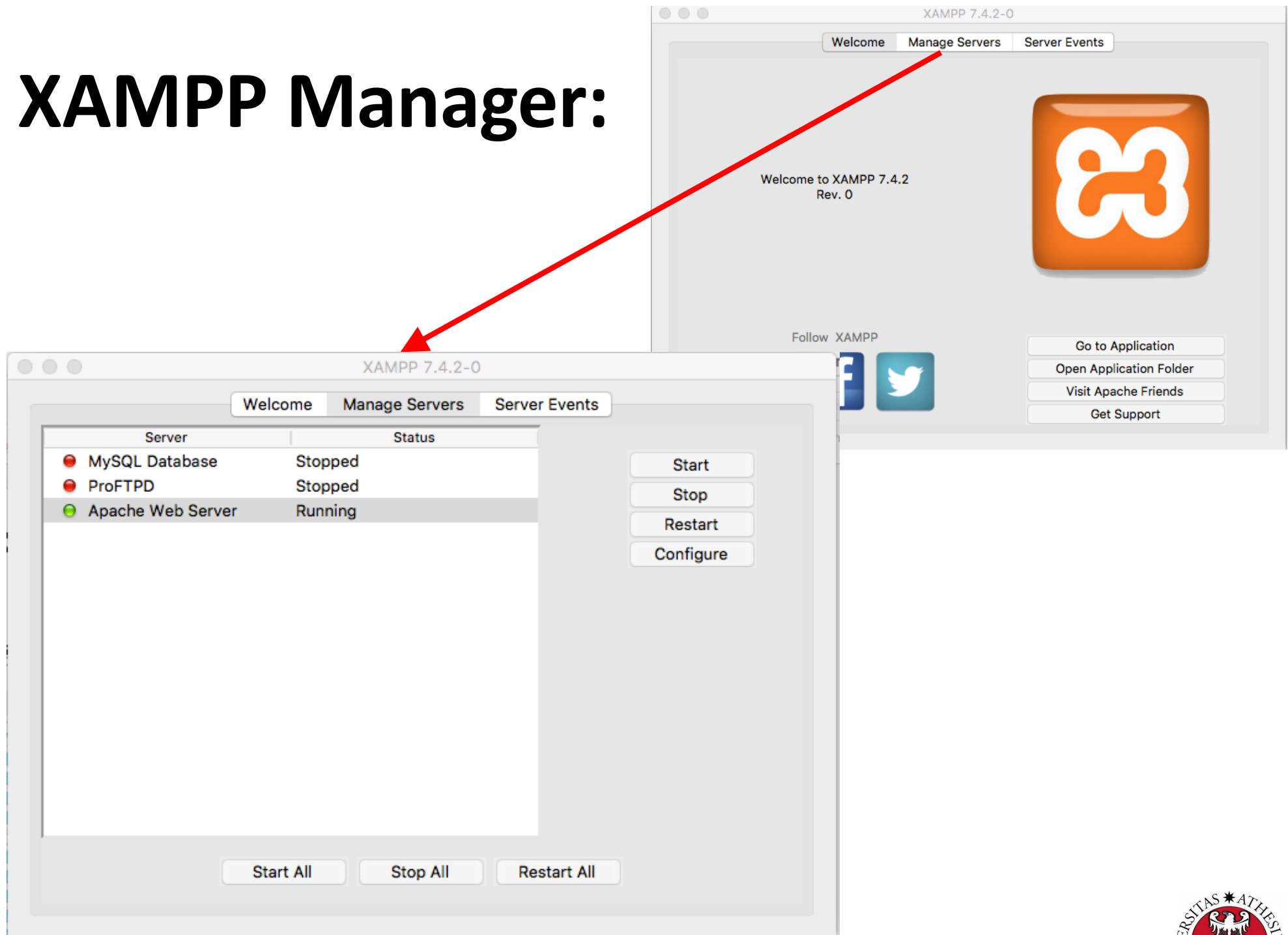
A screenshot of a Mac OS X Finder window titled "xamppfiles". The window contains a list of files and folders. A red arrow points from the title bar of the Finder window down to the "xamppfiles" folder icon in the list. The list includes: apache2, bin, build, cgi-bin, ctlscript.sh, docs, error, etc, htdocs, icons, img, include, info, lib, libexec, licenses, logs, man, and manager-osx.app. The "ctlscript.sh" file is highlighted, showing a size of 26 KB. The "manager-osx.app" file at the bottom is highlighted, showing a size of 10.4 MB.

Name	Date Modified	Size
apache2	Today at 21:31	--
bin	Today at 21:32	--
build	Today at 21:34	--
cgi-bin	Today at 21:32	--
ctlscript.sh	Today at 21:31	26 KB
docs	Today at 21:34	--
error	Today at 21:32	--
etc	Today at 21:34	--
htdocs	Today at 21:32	--
icons	Today at 21:32	--
img	Today at 21:31	--
include	Today at 21:34	--
info	Today at 21:34	--
lib	Today at 21:35	--
libexec	Today at 21:31	--
licenses	Today at 21:32	--
logs	Today at 21:39	--
man	Today at 21:34	--
manager-osx.app	Today at 21:35	10.4 MB

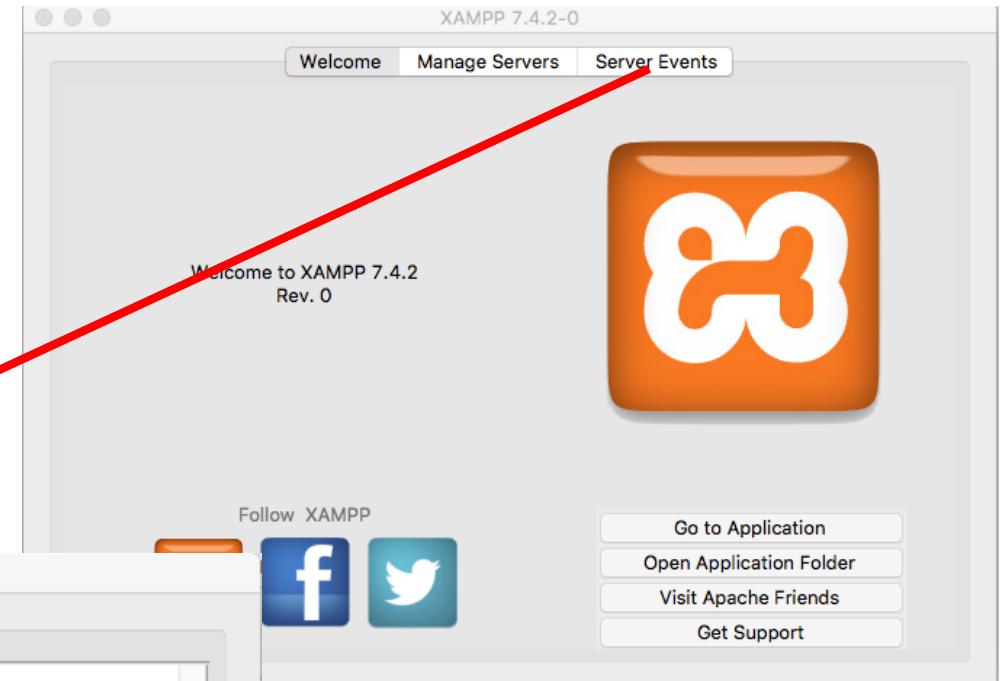
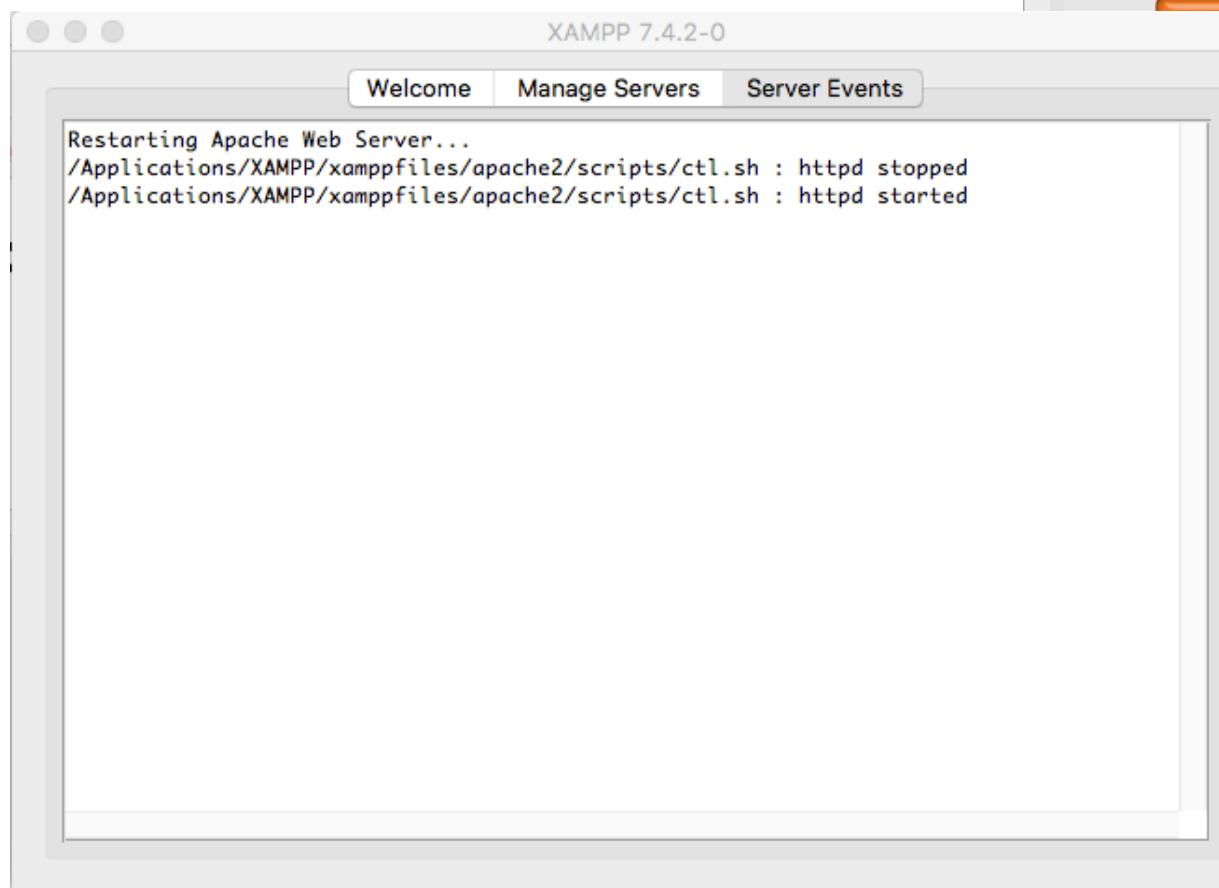
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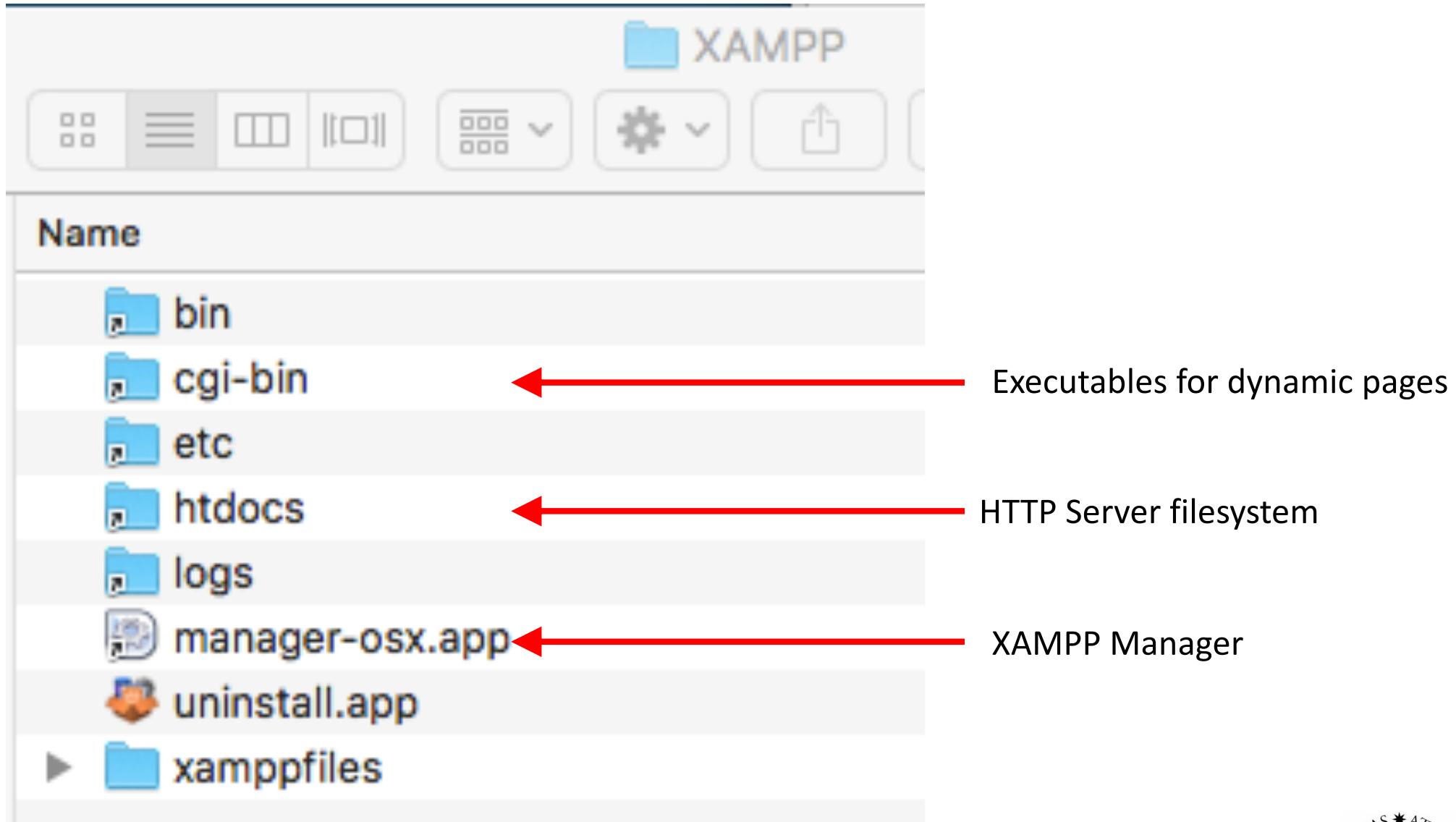
XAMPP Manager:



XAMPP Manager:



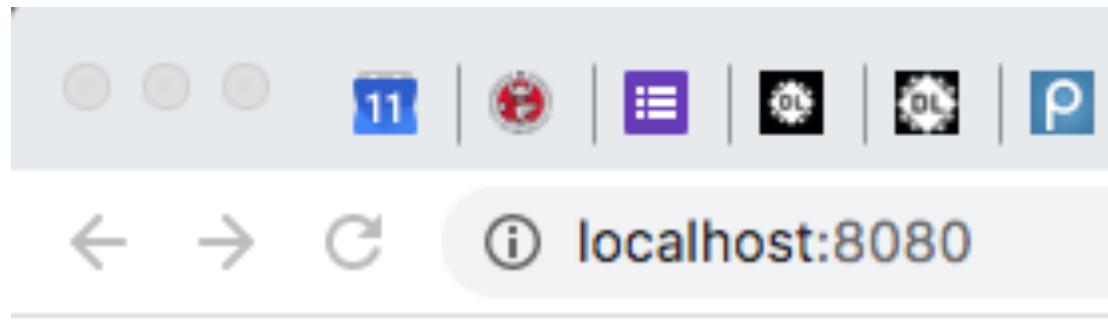
Main files e directories



Modifying server content

```
MR-MBP-14955:local ronchet$ cd /Applications/XAMPP/xamppfiles/htdocs  
MR-MBP-14955:htdocs ronchet$ touch index.html  
MR-MBP-14955:htdocs ronchet$ vi index.html  
MR-MBP-14955:htdocs ronchet$ cat index.html  
hello
```

Create empty file
Edit file
Show content



hello

APACHE DEFAULTS ARE: index.html, index.php

Apache configuration

See

http://www.cellbiol.com/bioinformatics_web_development/chapter-2-the-linux-operating-system-setting-up-a-linux-web-server/apache-web-server-configuration/

(has to be adapted to your locations)

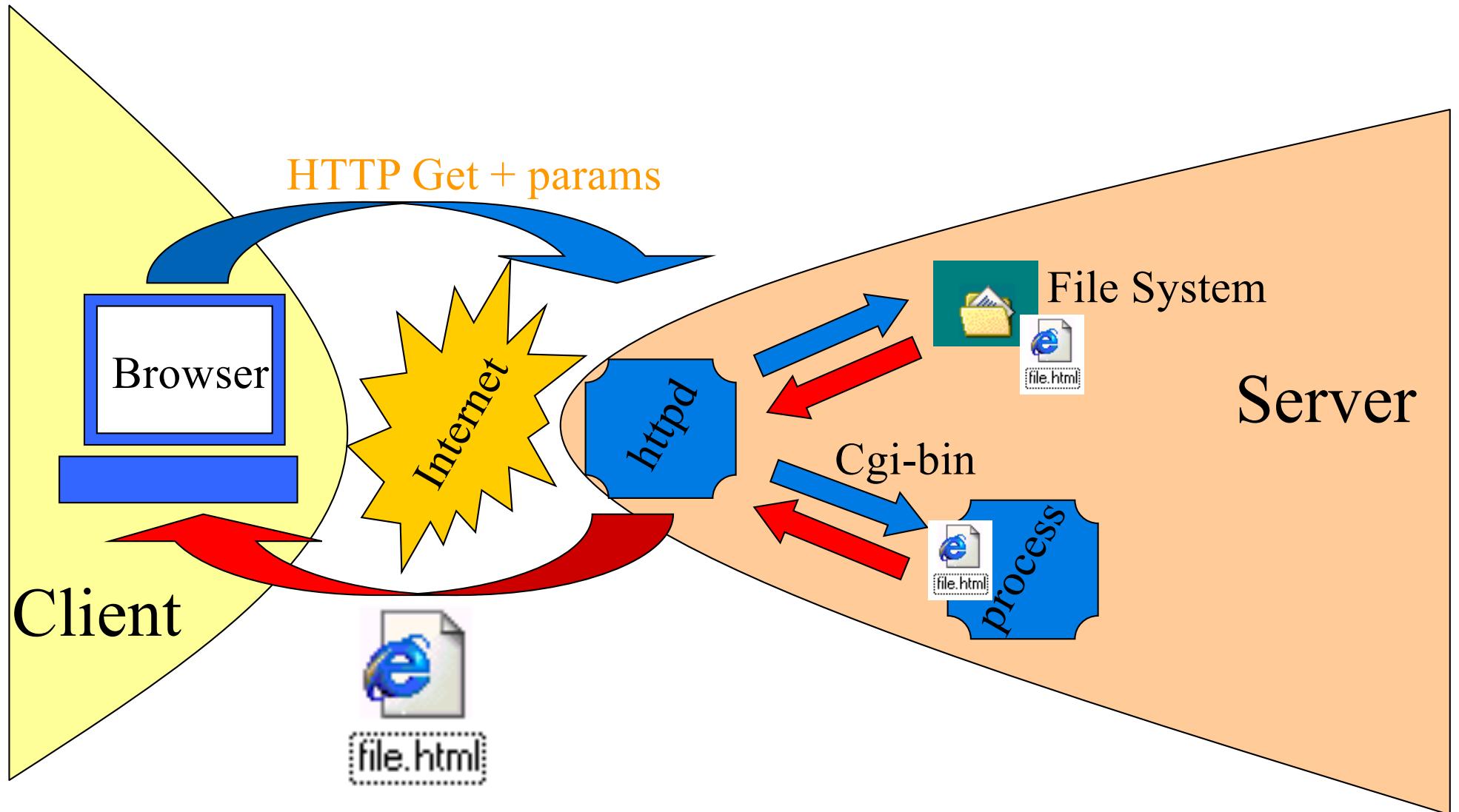
Step 2: let's use our web server to generate dynamic pages

Dynamic pages: the main idea:

We want to obtain NON STATIC information from the server. This implies executing some code on it, and send the results to the user.

e.g.: what's the time?

The original web architecture: dynamic pages



Evolution 1: dynamically create (interlinked) documents



The first implementation: CGI

The Common Gateway Interface was (is) a way to tell the server to spawn a process, get its results and send them as HTTP response.

Reading:

- <https://computer.howstuffworks.com/cgi.htm>
- https://en.wikipedia.org/wiki/Common_Gateway_Interface

Follower: FastCGI

- <https://en.wikipedia.org/wiki/FastCGI>

Creating dynamic pages

```
MR-MBP-14955:local ronchet$ cd /Applications/XAMPP/xamppfiles/cgi-bin  
MR-MBP-14955:htdocs ronchet$ touch getTime.sh  
MR-MBP-14955:htdocs ronchet$ vi getTime.sh  
MR-MBP-14955:htdocs ronchet$ cat getTime.sh  
#!/bin/sh  
echo `date`  
MR-MBP-14955:cgi-bin ronchet$ ls -la getTime.sh ← Show permissions  
-rw-r--r-- 1 ronchet admin 22 Feb 11 22:26 getTime.sh  
MR-MBP-14955:cgi-bin ronchet$ chmod 755 getTime.sh ← Make file executable  
MR-MBP-14955:cgi-bin ronchet$ ls -la getTime.sh ← Show permissions again  
-rwxr-xr-x 1 ronchet admin 22 Feb 11 22:26 getTime.sh  
MR-MBP-14955:cgi-bin ronchet$ ./getTime.sh ← Execute file  
Tue Feb 11 22:28:56 CET 2020
```

Annotations:

- Create empty file (points to the first command)
- Edit file (points to the second command)
- Show content (points to the third command)
- Show permissions (points to the fifth command)
- Make file executable (points to the sixth command)
- Show permissions again (points to the seventh command)
- Execute file (points to the ninth command)

← → ⌂

ⓘ localhost:8080/cgi-bin/getTime.sh

Server error!

The server encountered an internal error and was unable to complete your request.

Error message:

Premature end of script headers: getTime.sh

If you think this is a server error, please contact the [webmaster](#).

Error 500

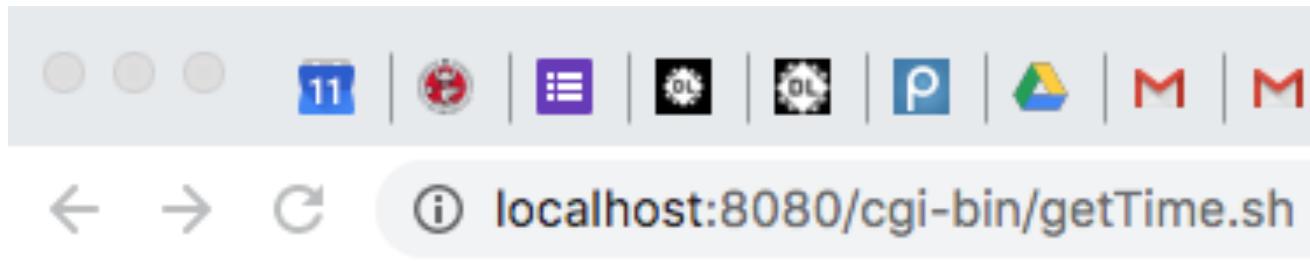
localhost

Apache/2.4.41 (Unix) OpenSSL/1.1.1d PHP/7.4.2 mod_perl/2.0.8-dev Perl/v5.16.3

Creating dynamic pages

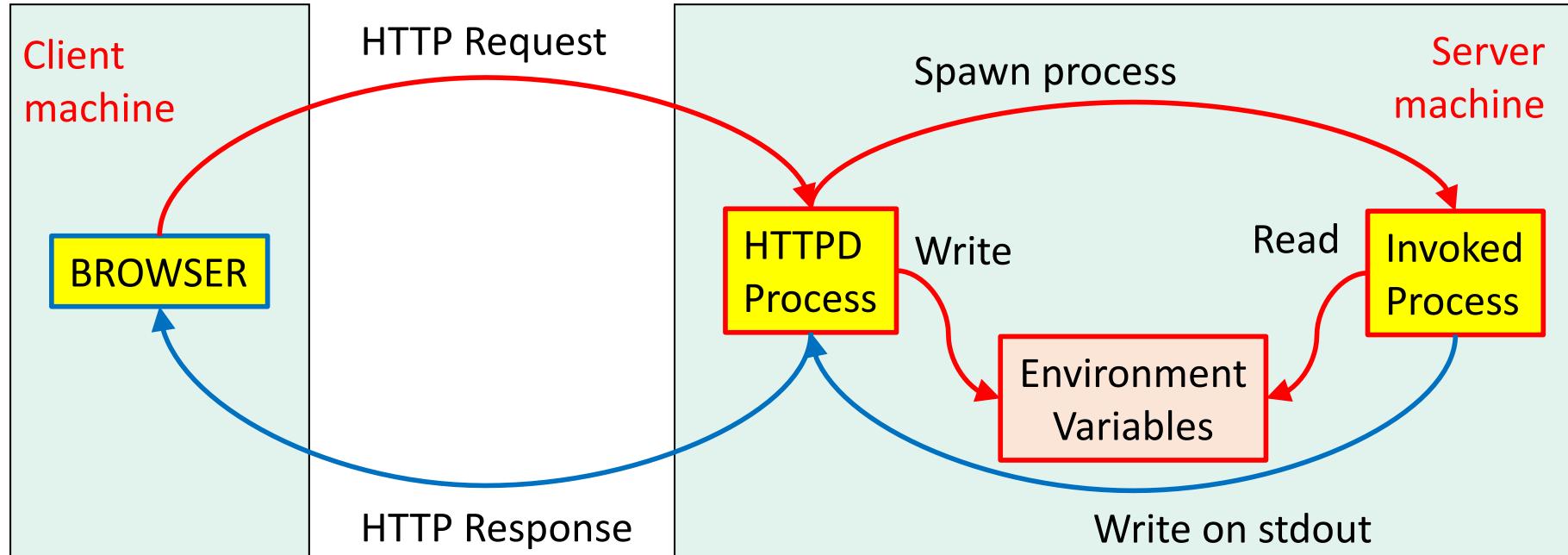
```
MR-MBP-14955:local ronchet$ cd /Applications/XAMPP/xamppfiles/cgi-bin  
MR-MBP-14955:htdocs ronchet$ vi getTime.sh  
MR-MBP-14955:htdocs ronchet$ cat getTime.sh  
#!/bin/sh  
echo "Content-type: text/plain; charset=iso-8859-1"  
echo  
echo `date`
```

Edit file
Show content



Tue Feb 11 22:43:02 CET 2020

Getting info about the request



Access to environment vars is supported
in all programming languages!

- **Server specific variables:**

- **SERVER_SOFTWARE** : *name/version of HTTP server.*
- **SERVER_NAME** : *host name of the server, may be dot-decimal IP address.*
- **GATEWAY_INTERFACE** : *CGI/version.*