Client-Server Architecture & XAMPP

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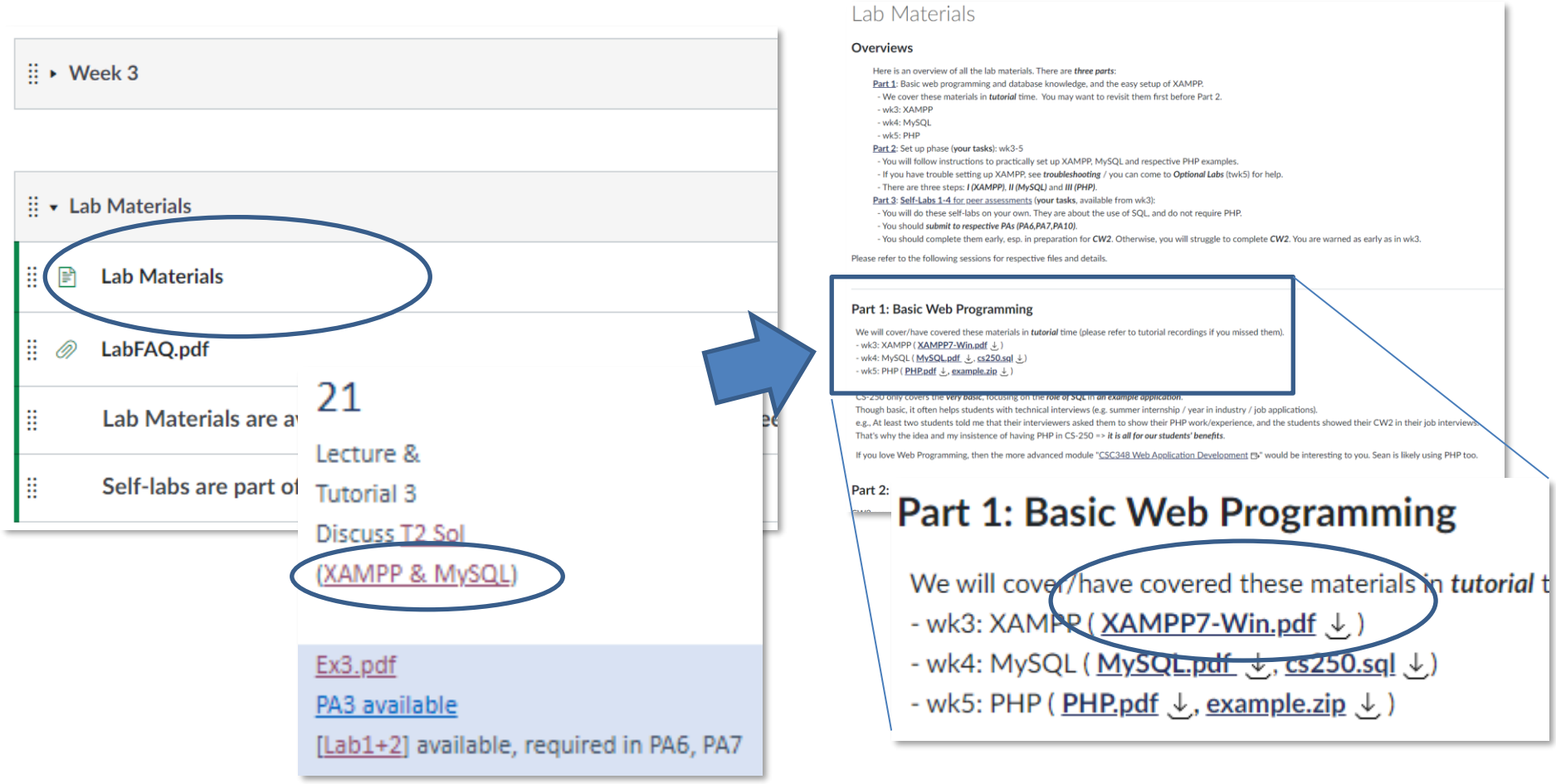
Lab Materials

- On Modules > Lab Materials (after wk3)

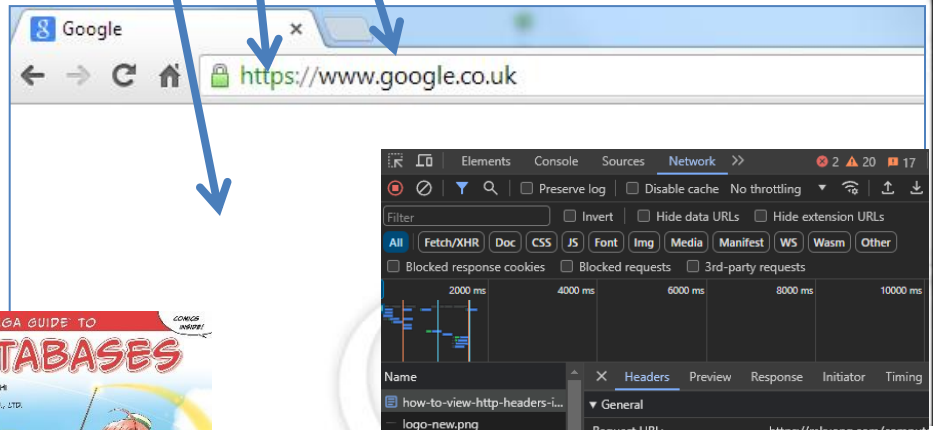


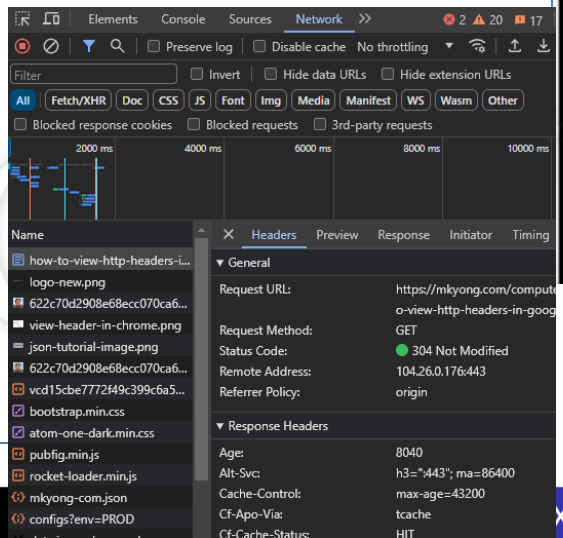
This Lecture

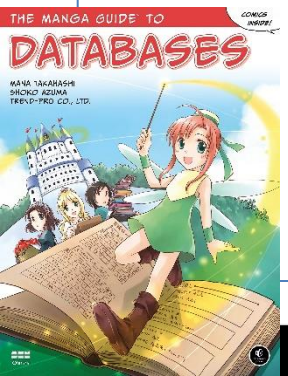
- Client Server Architecture
- XAMPP
- Security
- No excuses

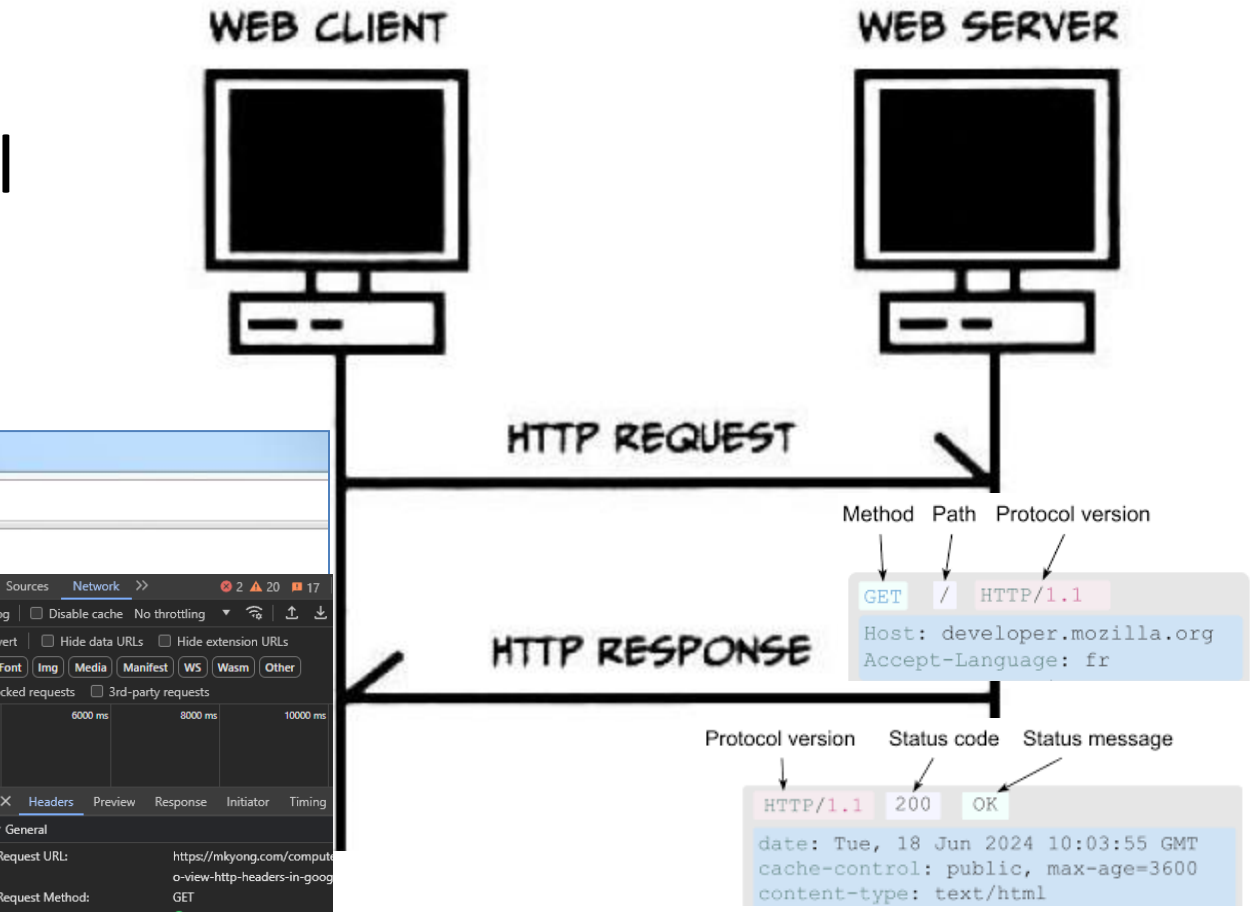
Client and Server

- Browser
- URL
- HTTP protocol
- HTML





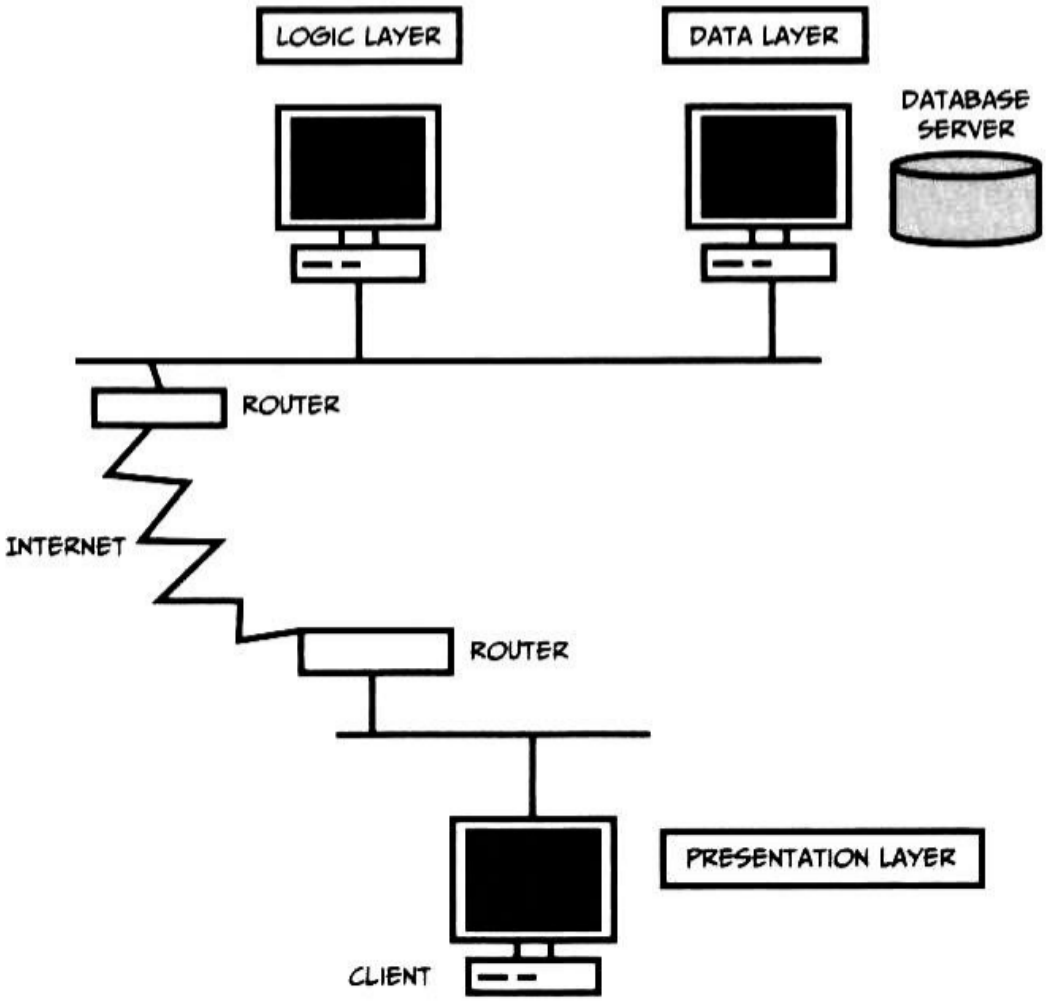




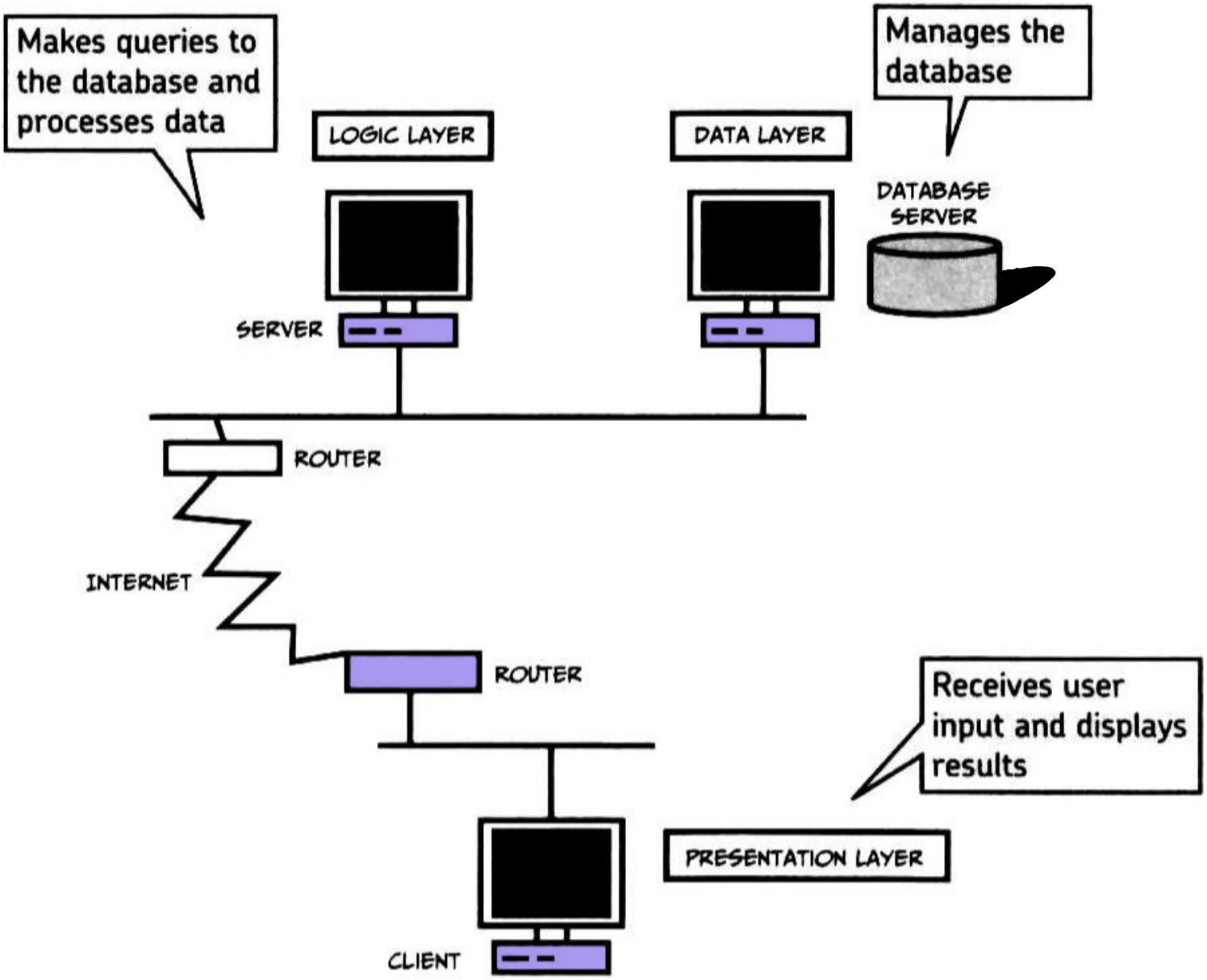
https://developer.mozilla.org/en-US/docs/Web/HTTP/Overview

Client and Server

- Three-tier client server
- Server are there waiting to serve

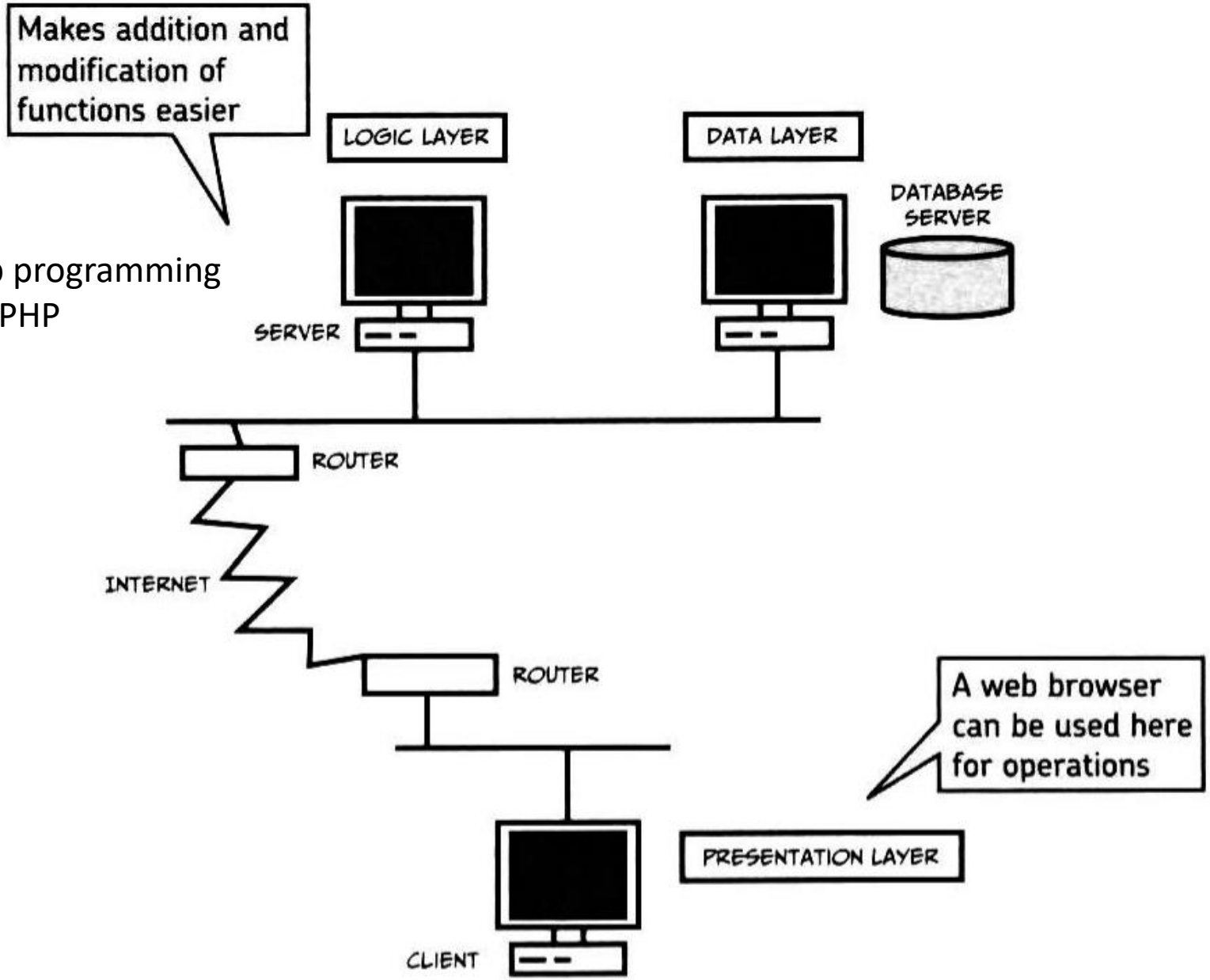


Client and Server



Client and Server

Web programming
e.g. PHP



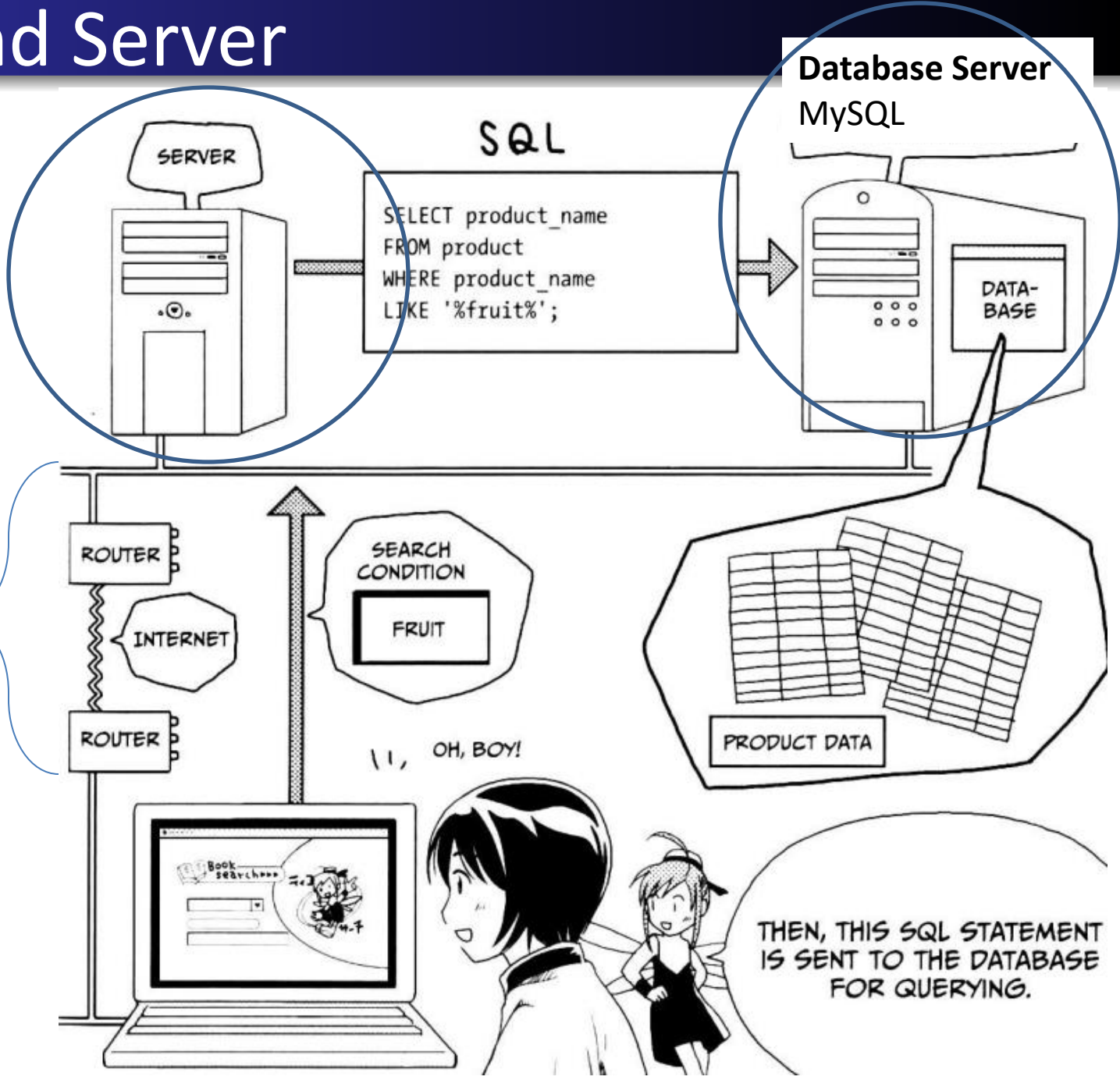
Client and Server

Web Server
HTTP: HTML, PHP

internet

Client
Browser

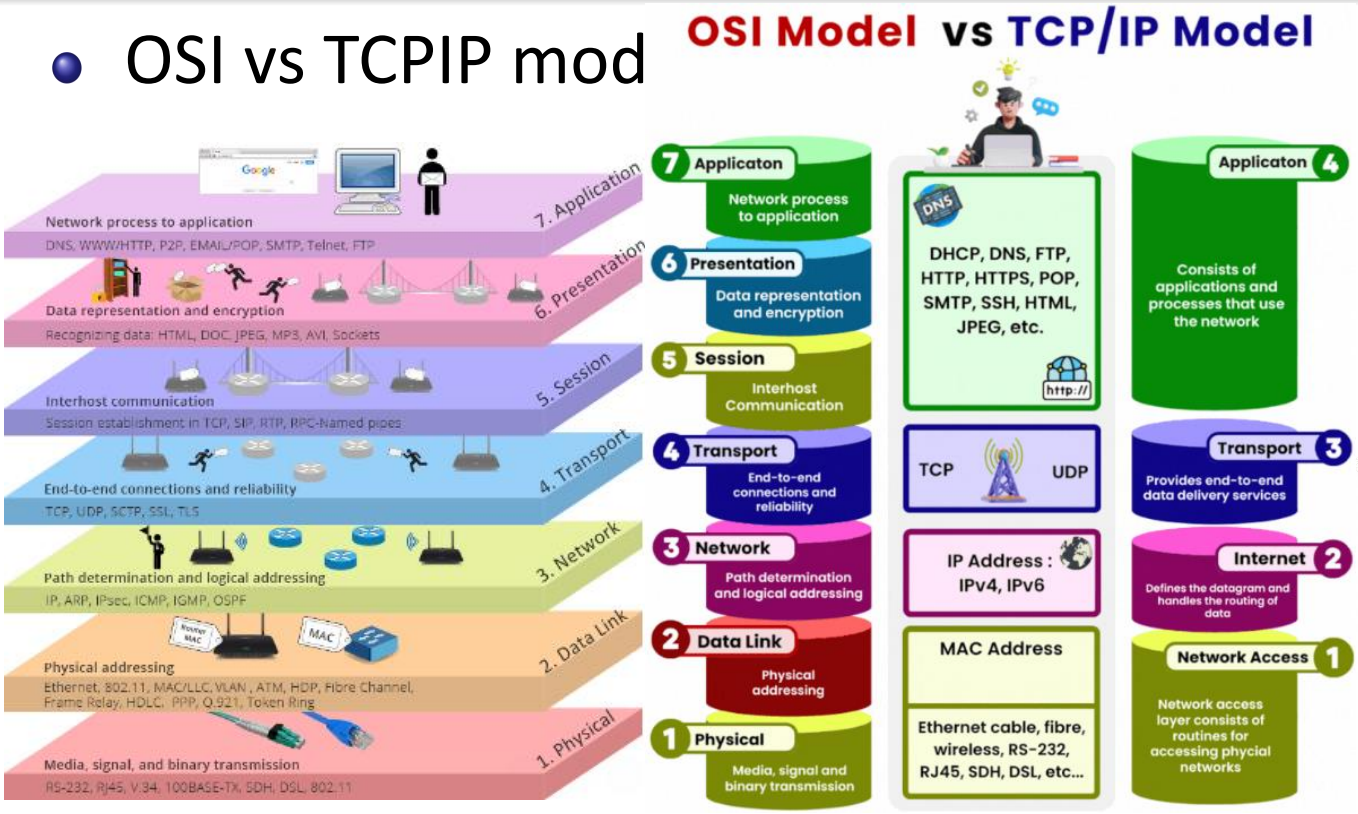
Online bookstore



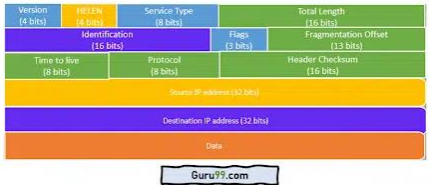
Internet? This slide is out of syllabus

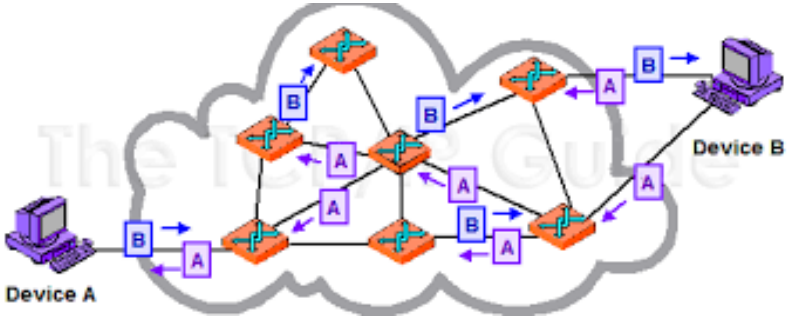
- OSI vs TCPIP mod

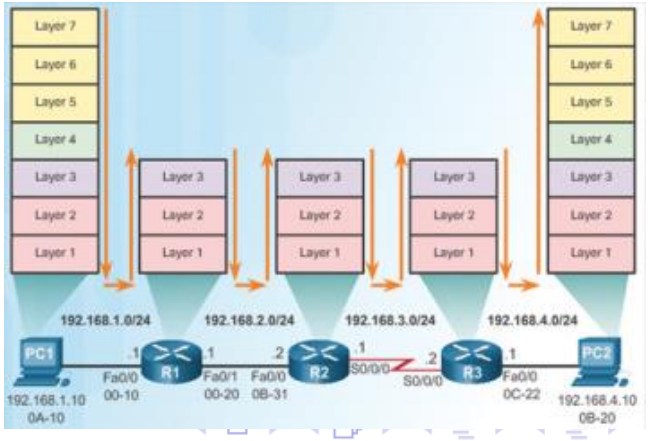
Algorithm



IPv4 Header Components/Fields







Web server?

- To set up PHP and MySQL at home, you need:
  - A web server e.g. Apache
  - MySQL server
  - PHP 5
- In the old days, setting up webserver is tedious
  - Apache needs to recognise PHP
  - PHP needs to talk to MySQL
- Many many many many config (ini) files to set! And no good documentation!

XAMPP

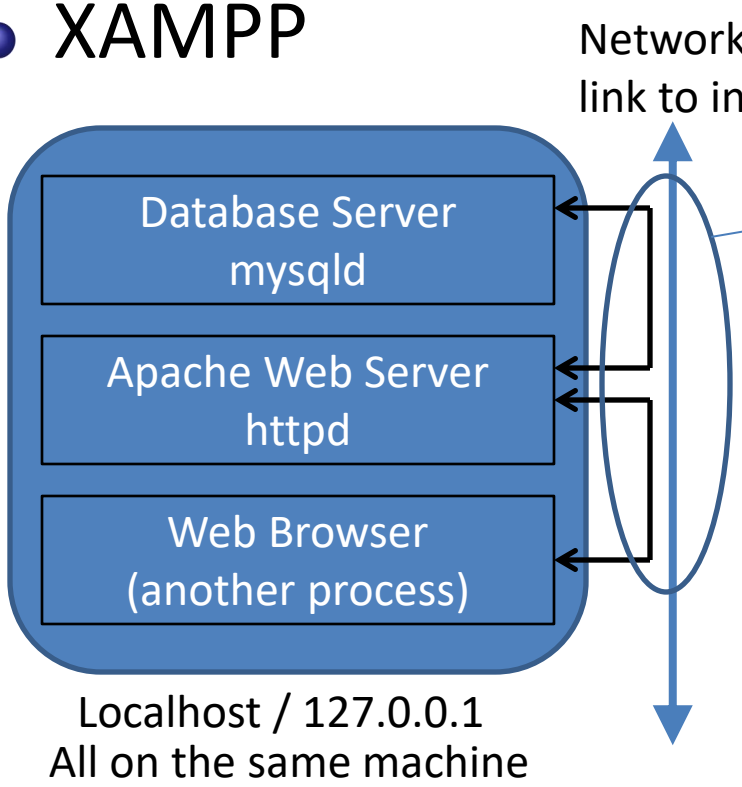
- XAMPP all-in-one. All are installed at the same time, and set up for you.

- http://www.apachefriends.org/en/xampp.html

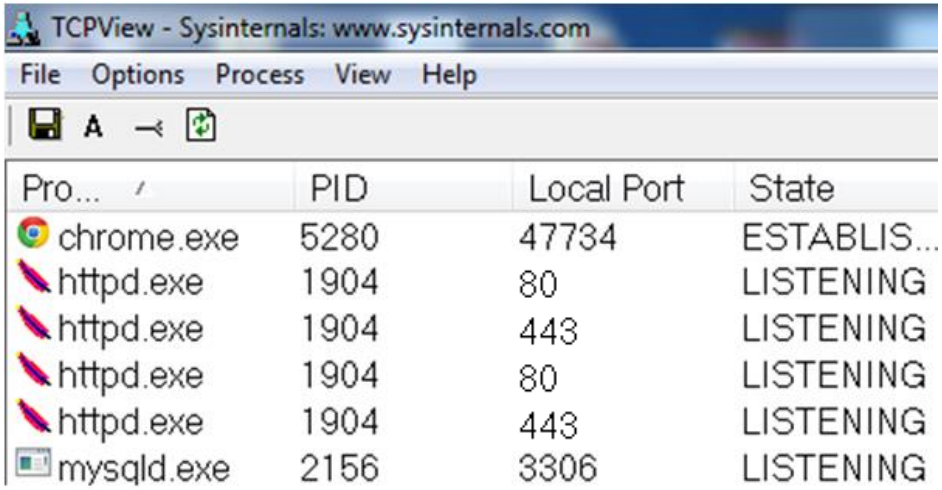
Note, it is for development testing. Not for production use.
As a CS student, knowing how to install and use XAMPP is BASIC skills.

XAMPP & Three-Tier Architecture

- XAMPP



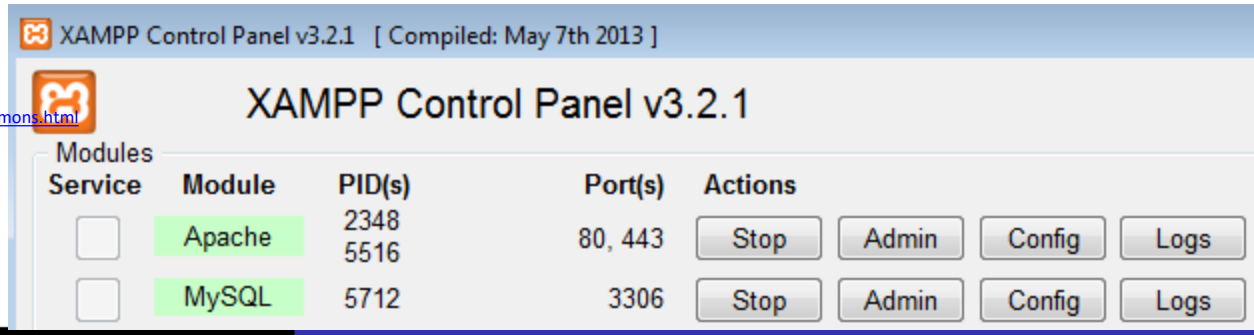
Communicate through local network interface



what does “d” mean?

https://www.techtarget.com/whatis/definition/daemon
https://docs.freebsd.org/doc/6.1-RELEASE/usr/share/doc/handbook/basics-daemons.html

Remember!
Start the process

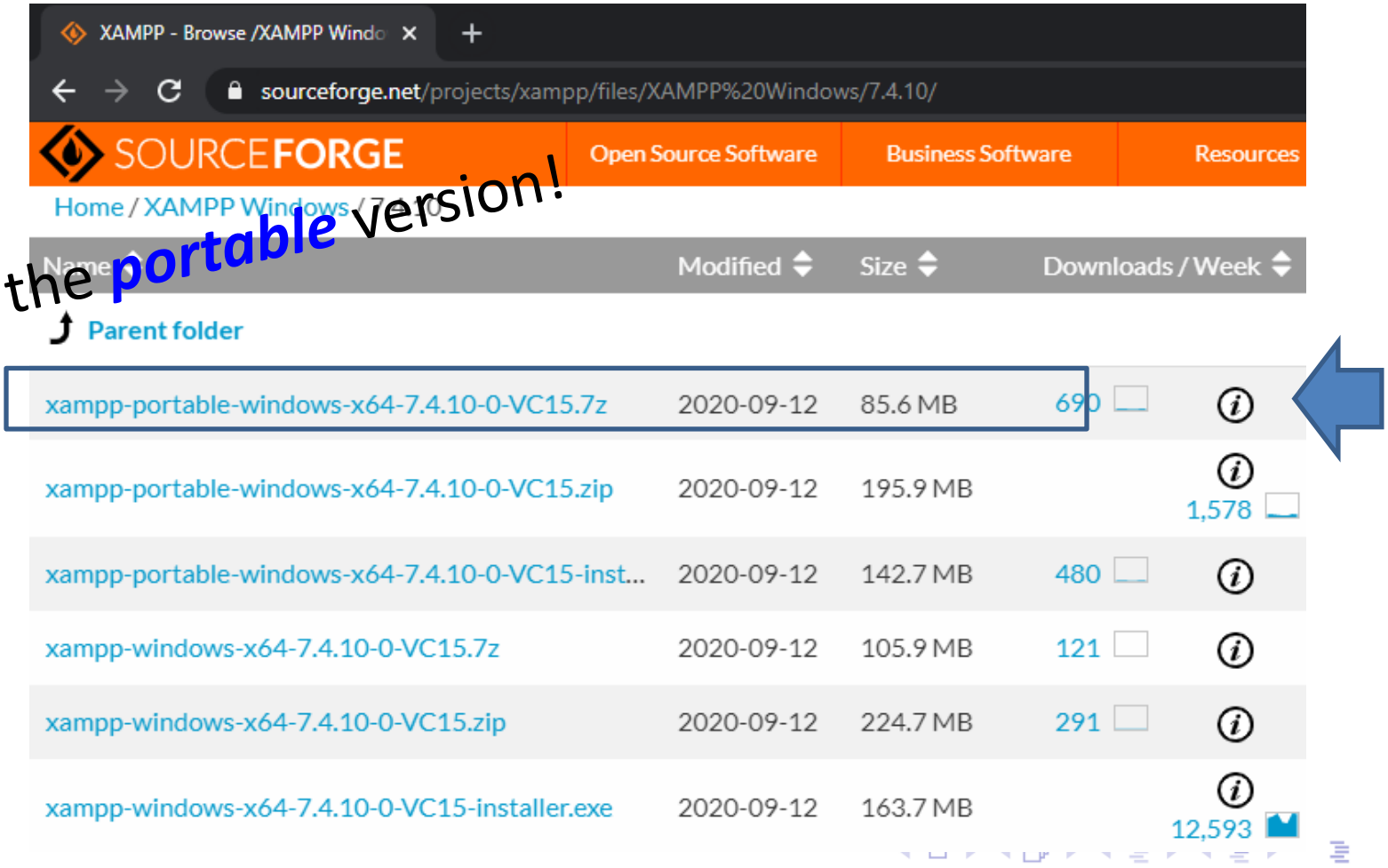


XAMPP

- Download from here:

In general all version work similarly but We tested on 7.4.10 only.

https://sourceforge.net/projects/xampp/files/XAMPP%20Windows/7.4.10/



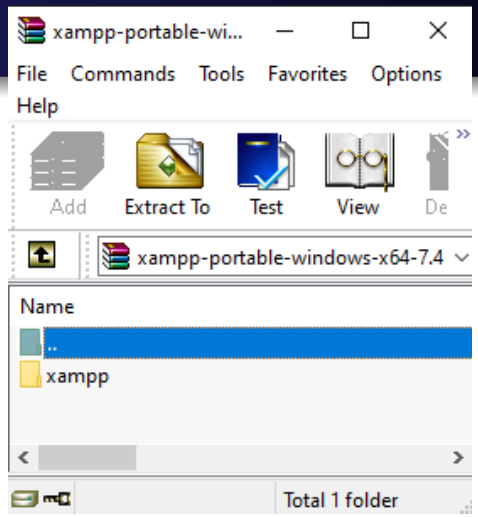
Use the **portable** version!

XAMPP

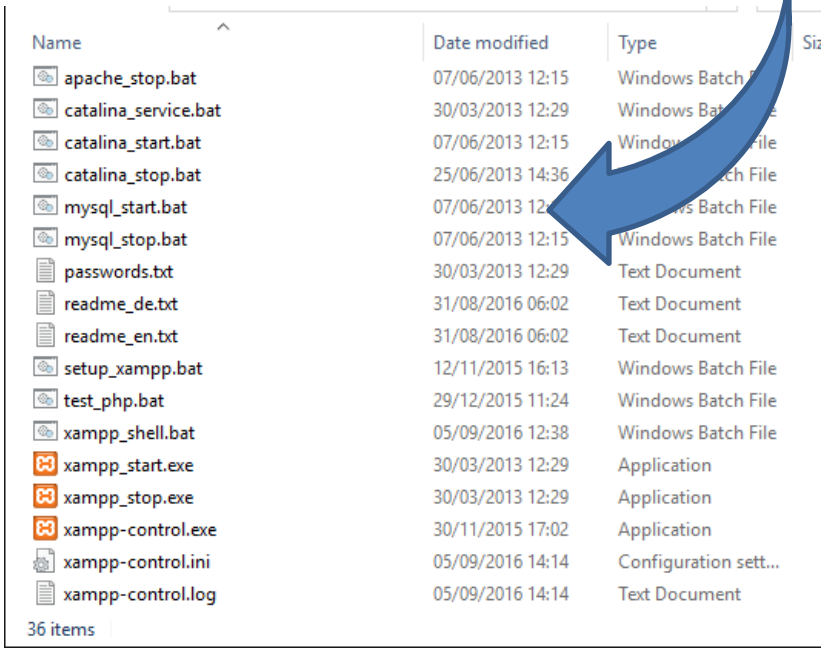
- Extract to a folder on the drive, e.g.
- D:/xampp
- E:/xampp
- G:/xampp

- If you work across multiple machines, use a (fast) USB stick

- Extract to a folder on the stick (e.g. H:/xampp)



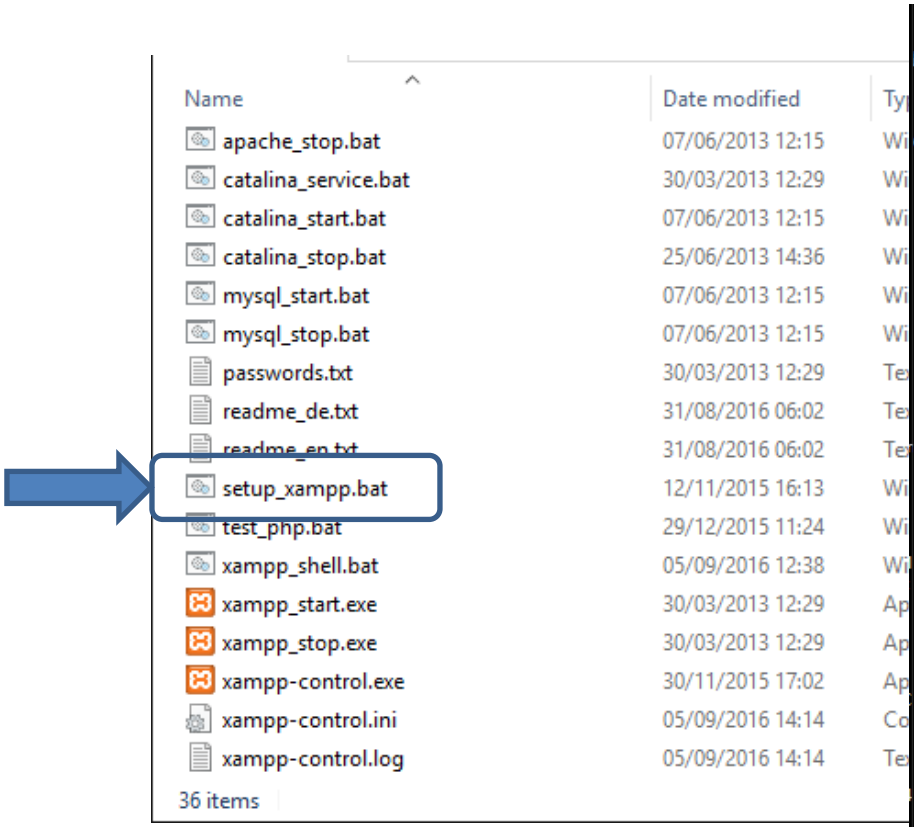
decompress

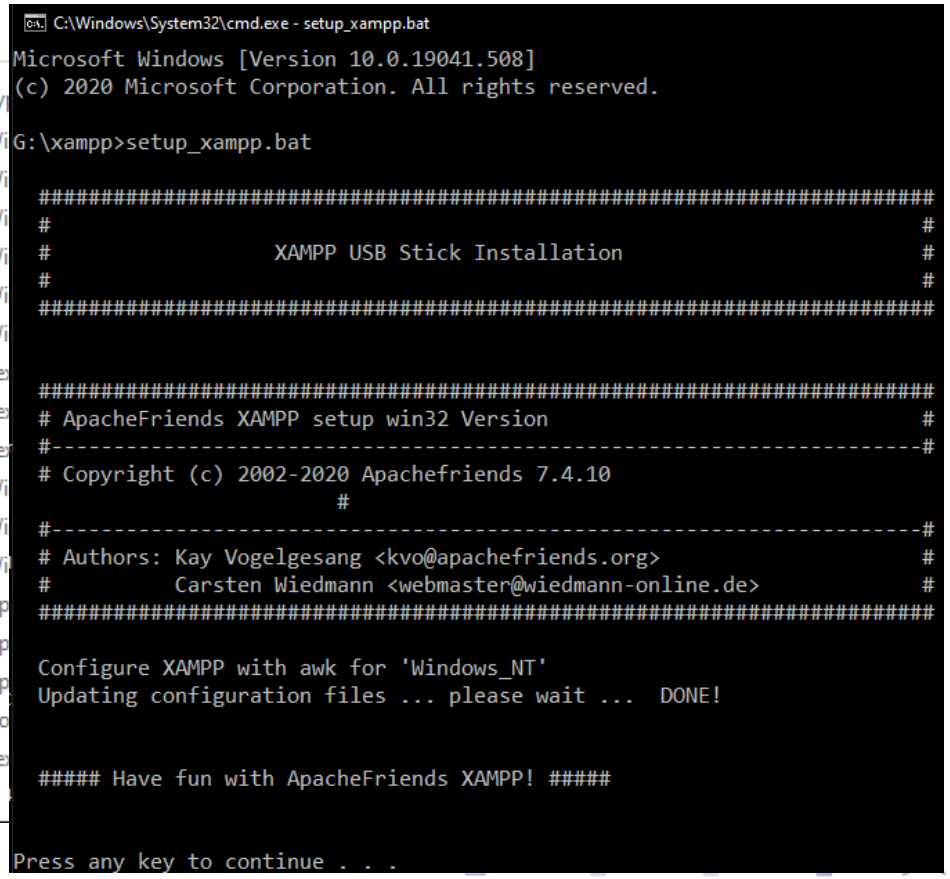


XAMPP

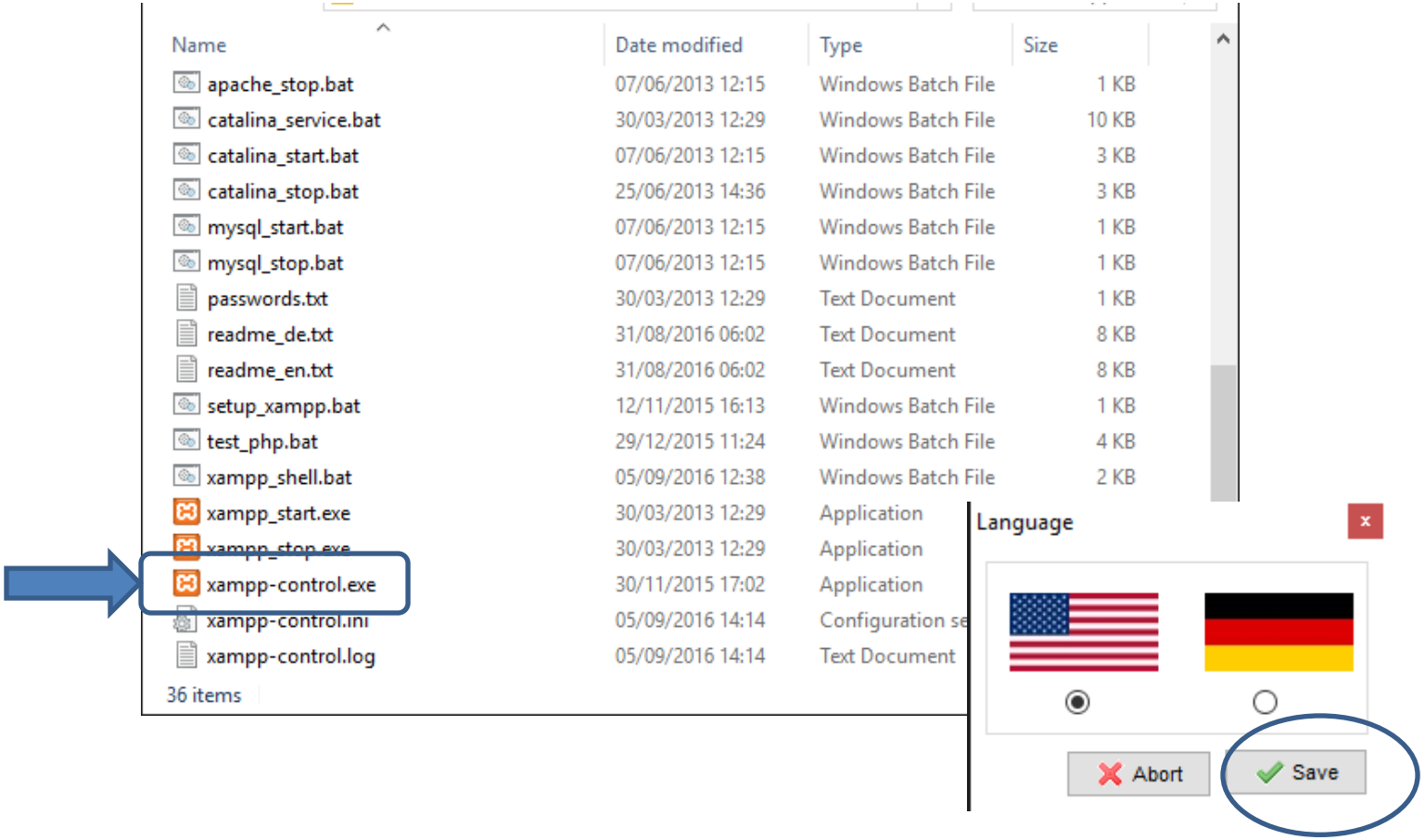
- *** Important ***
- Double click the ***setup_xampp.bat***
- ***Do it whenever you run it on a new machine***

Update the drive letter in XAMPP internal scripts



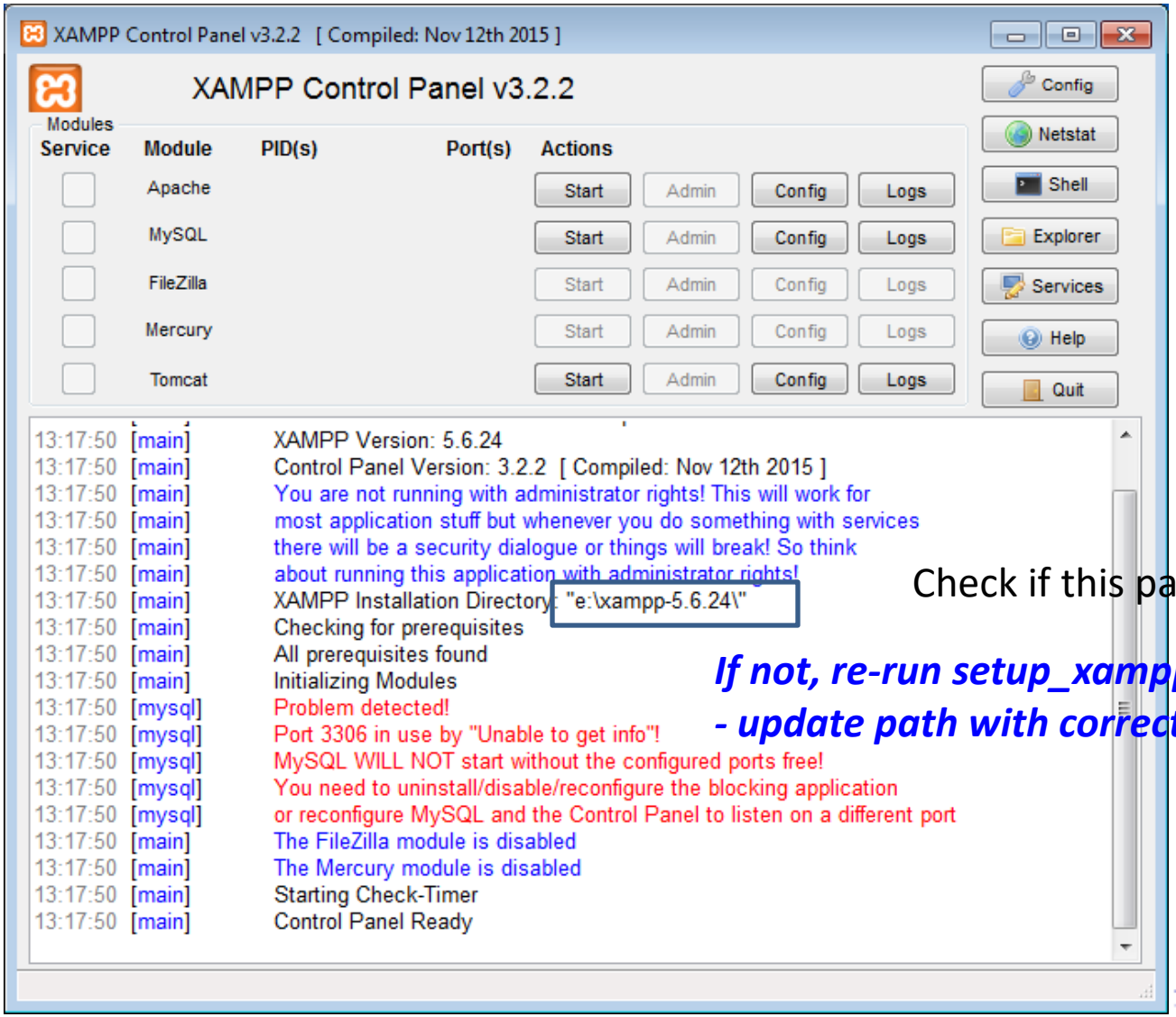


- Then double click to run ***xampp-control.exe***



XAMPP

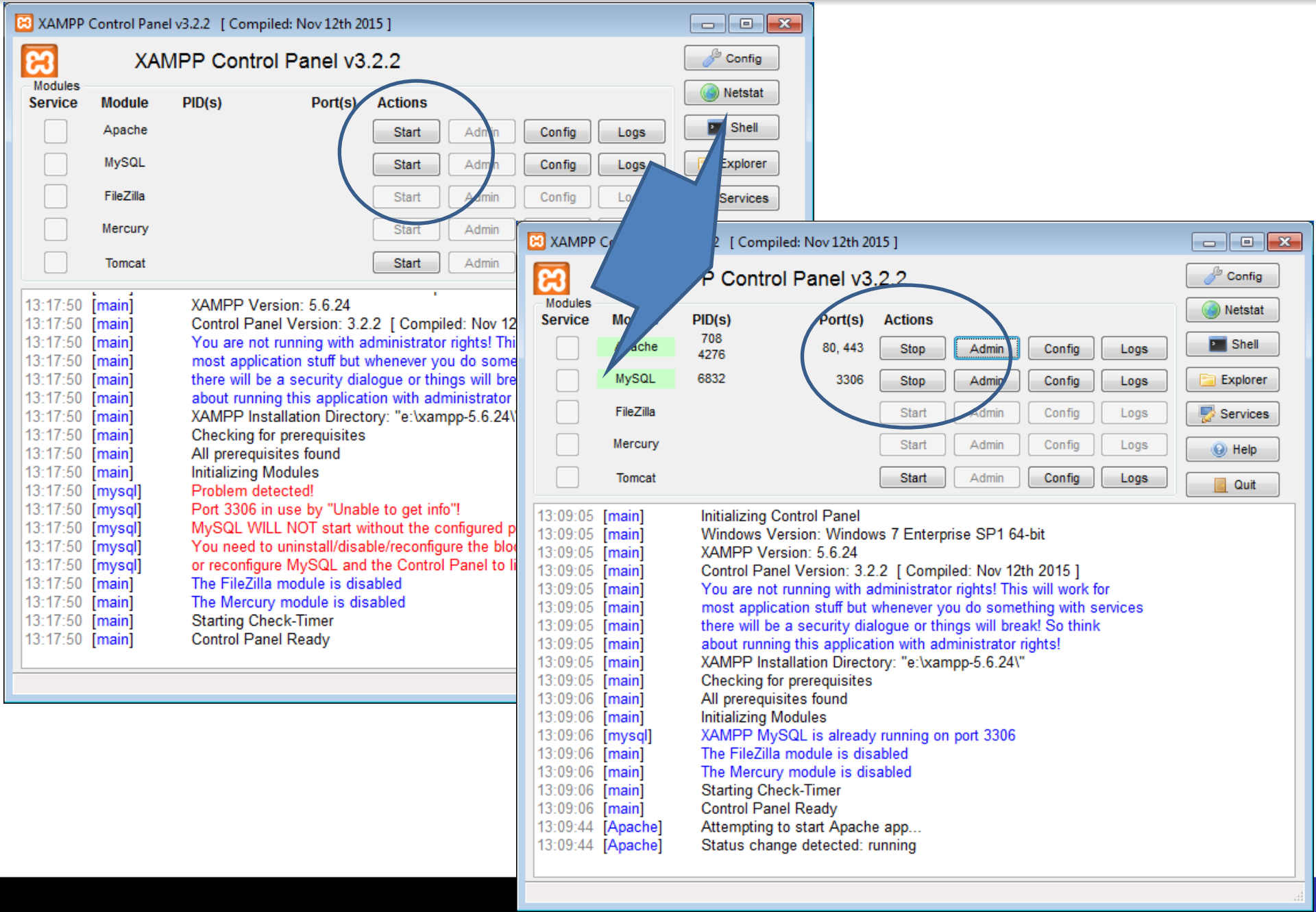
- XAMPP Control Panel



Check if this path is correct.

If not, re-run setup_xampp.bat
- update path with correct drive letter

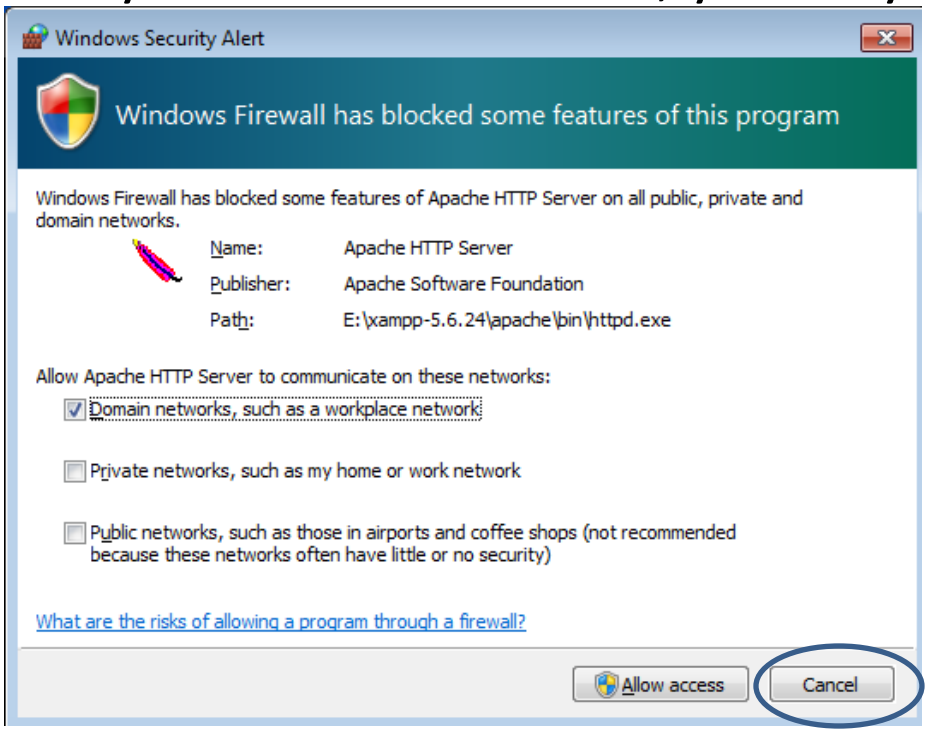
XAMPP

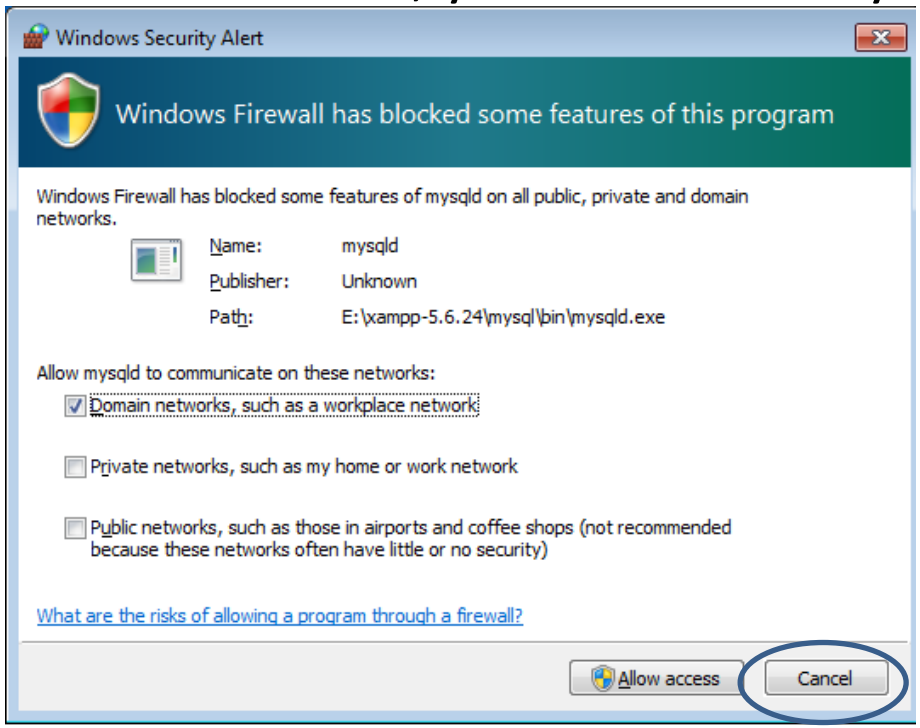

XAMPP Control Panel v3.2.2 [Compiled: Nov 12th 2015]
XAMPP Control Panel v3.2.2
Modules
Service Module PID(s) Port(s) Actions
Apache Start Admin Config Logs
MySQL Start Admin Config Logs
FileZilla Start Admin Config Logs
Mercury Start Admin
Tomcat Start Admin
Config
Netstat
Shell
Explorer
Services
13:17:50 [main] XAMPP Version: 5.6.24
13:17:50 [main] Control Panel Version: 3.2.2 [Compiled: Nov 12
13:17:50 [main] You are not running with administrator rights! Thi
13:17:50 [main] most application stuff but whenever you do some
13:17:50 [main] there will be a security dialogue or things will bre
13:17:50 [main] about running this application with administrator
13:17:50 [main] XAMPP Installation Directory: "e:\xampp-5.6.24\
13:17:50 [main] Checking for prerequisites
13:17:50 [main] All prerequisites found
13:17:50 [main] Initializing Modules
13:17:50 [mysql] Problem detected!
13:17:50 [mysql] Port 3306 in use by "Unable to get info"!
13:17:50 [mysql] MySQL WILL NOT start without the configured p
13:17:50 [mysql] You need to uninstall/disable/reconfigure the blo
13:17:50 [mysql] or reconfigure MySQL and the Control Panel to li
13:17:50 [main] The FileZilla module is disabled
13:17:50 [main] The Mercury module is disabled
13:17:50 [main] Starting Check-Timer
13:17:50 [main] Control Panel Ready
[Compiled: Nov 12th 2015]
P Control Panel v3.2.2
Modules
Service PID(s) Port(s) Actions
708
4276
80, 443 Stop Admin Config Logs
MySQL 6832
3306 Stop Admin Config Logs
FileZilla Start Admin Config Logs
Mercury Start Admin Config Logs
Tomcat Start Admin Config Logs
Config
Netstat
Shell
Explorer
Services
Help
Quit
13:09:05 [main] Initializing Control Panel
13:09:05 [main] Windows Version: Windows 7 Enterprise SP1 64-bit
13:09:05 [main] XAMPP Version: 5.6.24
13:09:05 [main] Control Panel Version: 3.2.2 [Compiled: Nov 12th 2015]
13:09:05 [main] You are not running with administrator rights! This will work for
13:09:05 [main] most application stuff but whenever you do something with services
13:09:05 [main] there will be a security dialogue or things will break! So think
13:09:05 [main] about running this application with administrator rights!
13:09:05 [main] XAMPP Installation Directory: "e:\xampp-5.6.24\"
13:09:05 [main] Checking for prerequisites
13:09:06 [main] All prerequisites found
13:09:06 [main] Initializing Modules
13:09:06 [mysql] XAMPP MySQL is already running on port 3306
13:09:06 [main] The FileZilla module is disabled
13:09:06 [main] The Mercury module is disabled
13:09:06 [main] Starting Check-Timer
13:09:06 [main] Control Panel Ready
13:09:44 [Apache] Attempting to start Apache app...
13:09:44 [Apache] Status change detected: running

XAMPP - Troubleshoot

Firewall alert! No worry.

If you do not see these, you may not have firewall, you should worry!

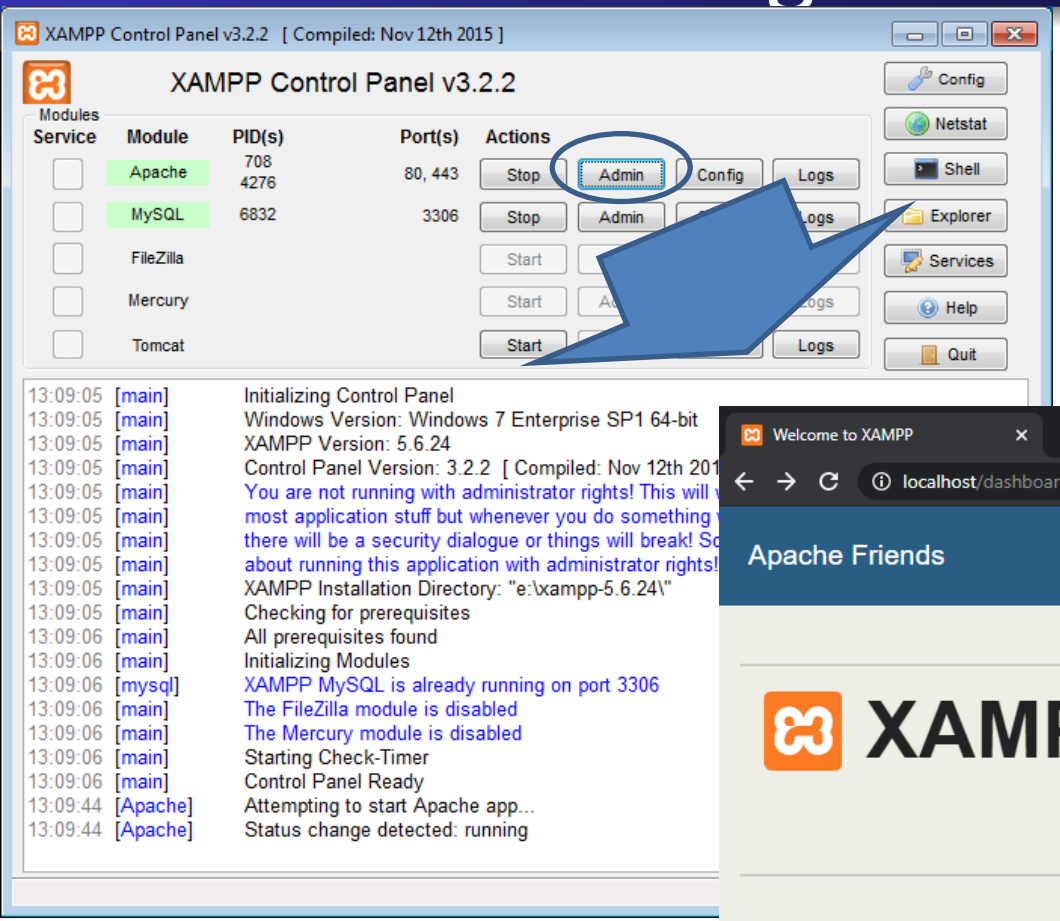




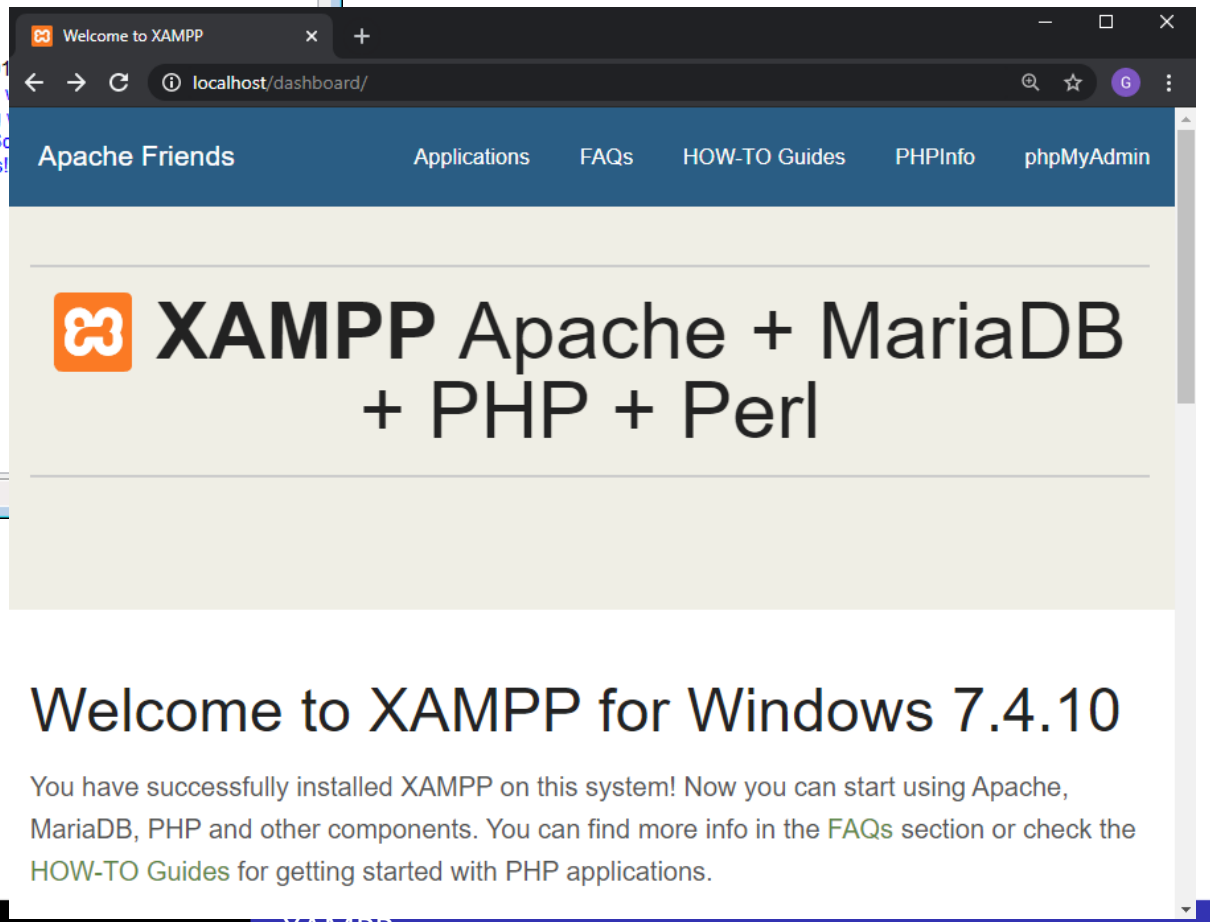
In Lab, click "***Cancel***" => You will not have permission to do anything.
At home, for highest security, click "***Cancel***" too.

If you want other machines in your home network to discover XAMPP server, choose "***private only***".

XAMPP - Testing

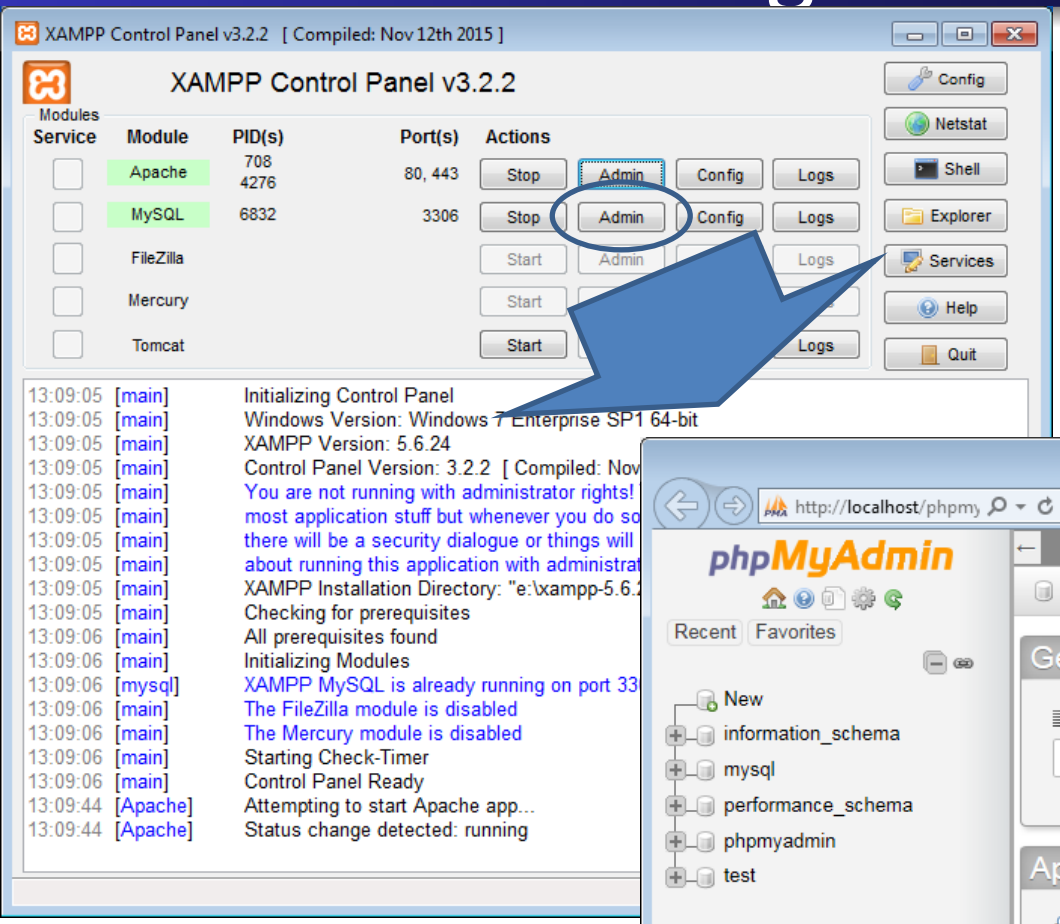


Or type in browser:
http://localhost

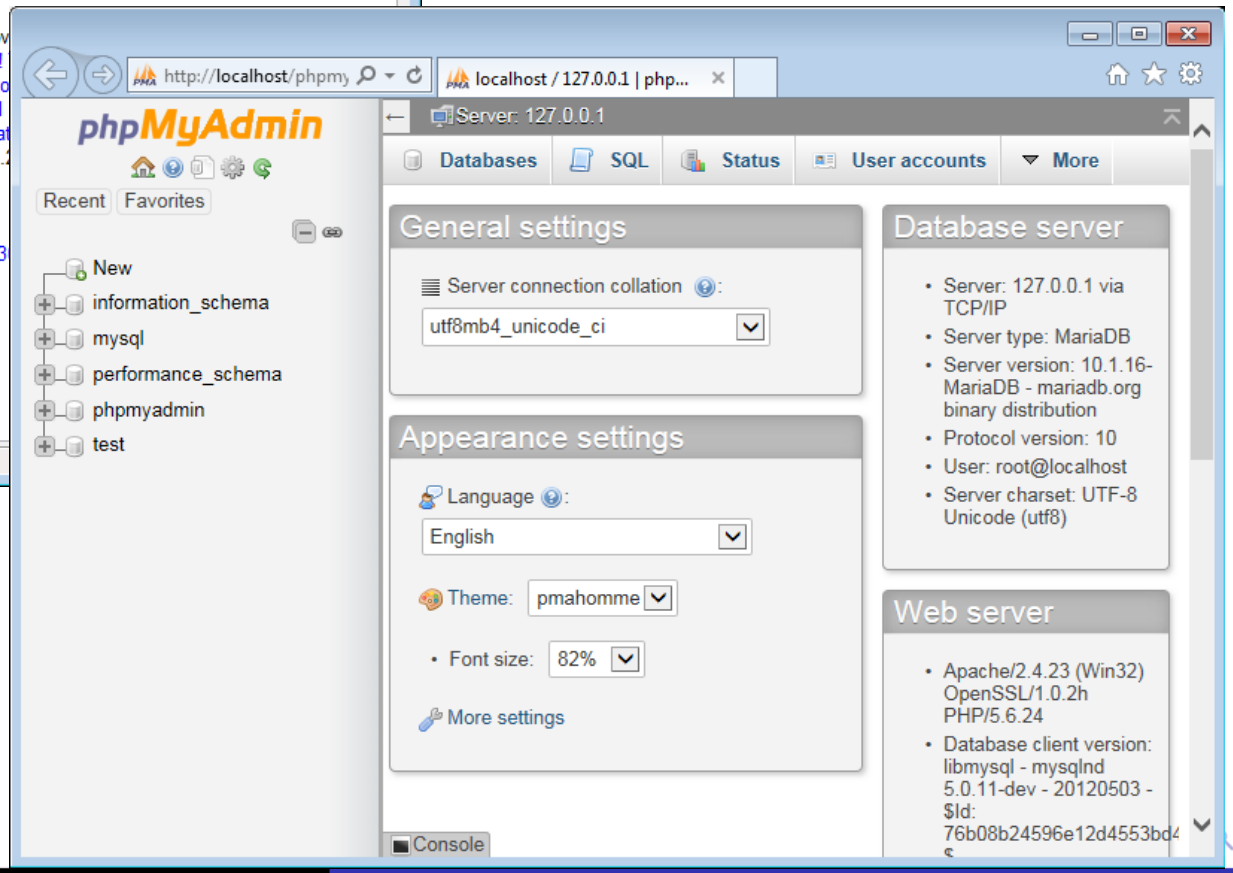


Your webserver is up and running.

XAMPP - Testing

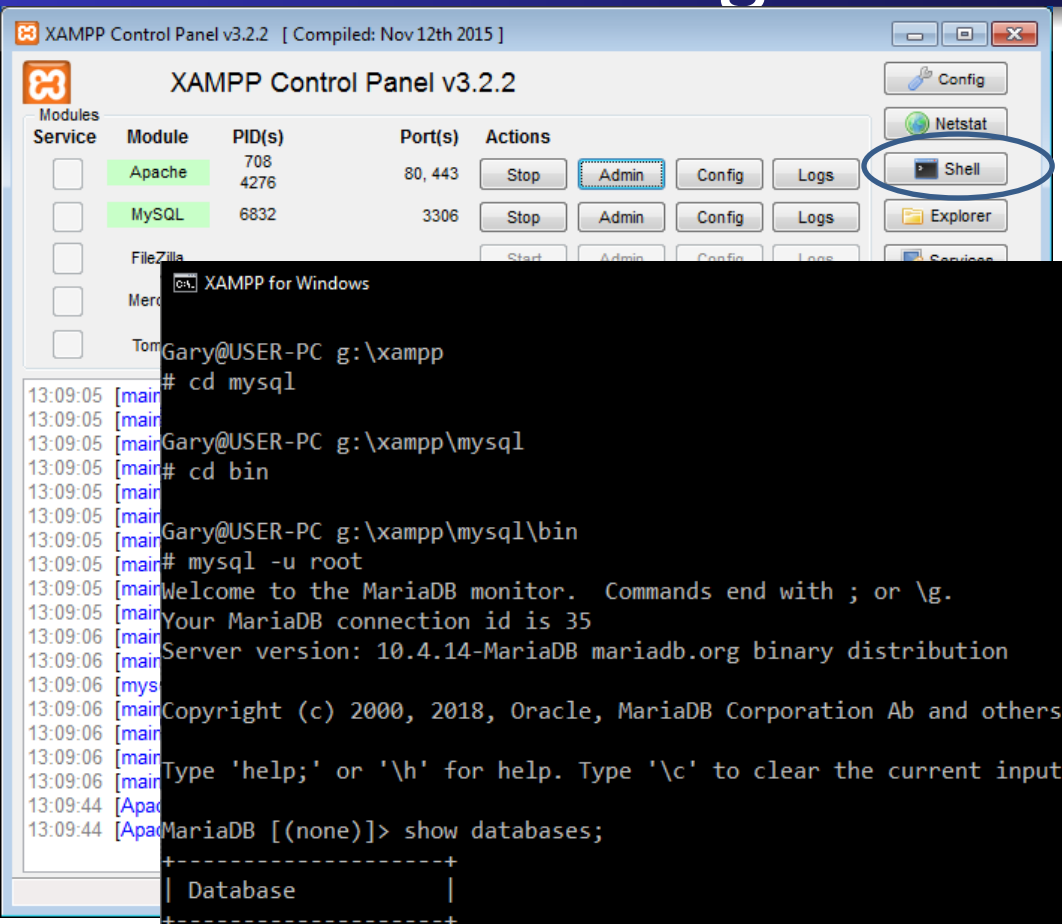


Or type in browser:
http://localhost/phpmyadmin



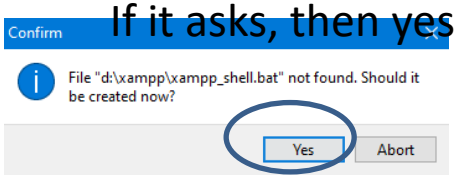
Your mysql server and
PHP scripting are
up and running

XAMPP-Testing



To use it, click “Shell”

If it asks, then yes.



Alternatively, you can type this:
xampp_shell.bat in cmd

MySQL is ready for use
mysql client locates at:
xampp/mysql/bin/mysql.exe

Then type:

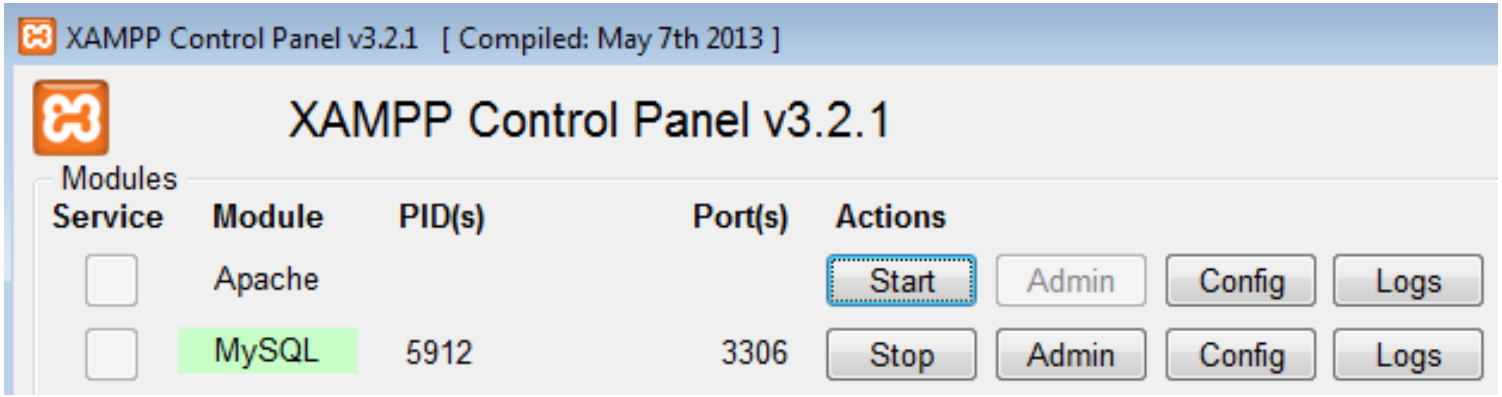
```
cd mysql
cd bin
mysql -u root
```

Inside MySQL type:

```
show databases;
quit;
```

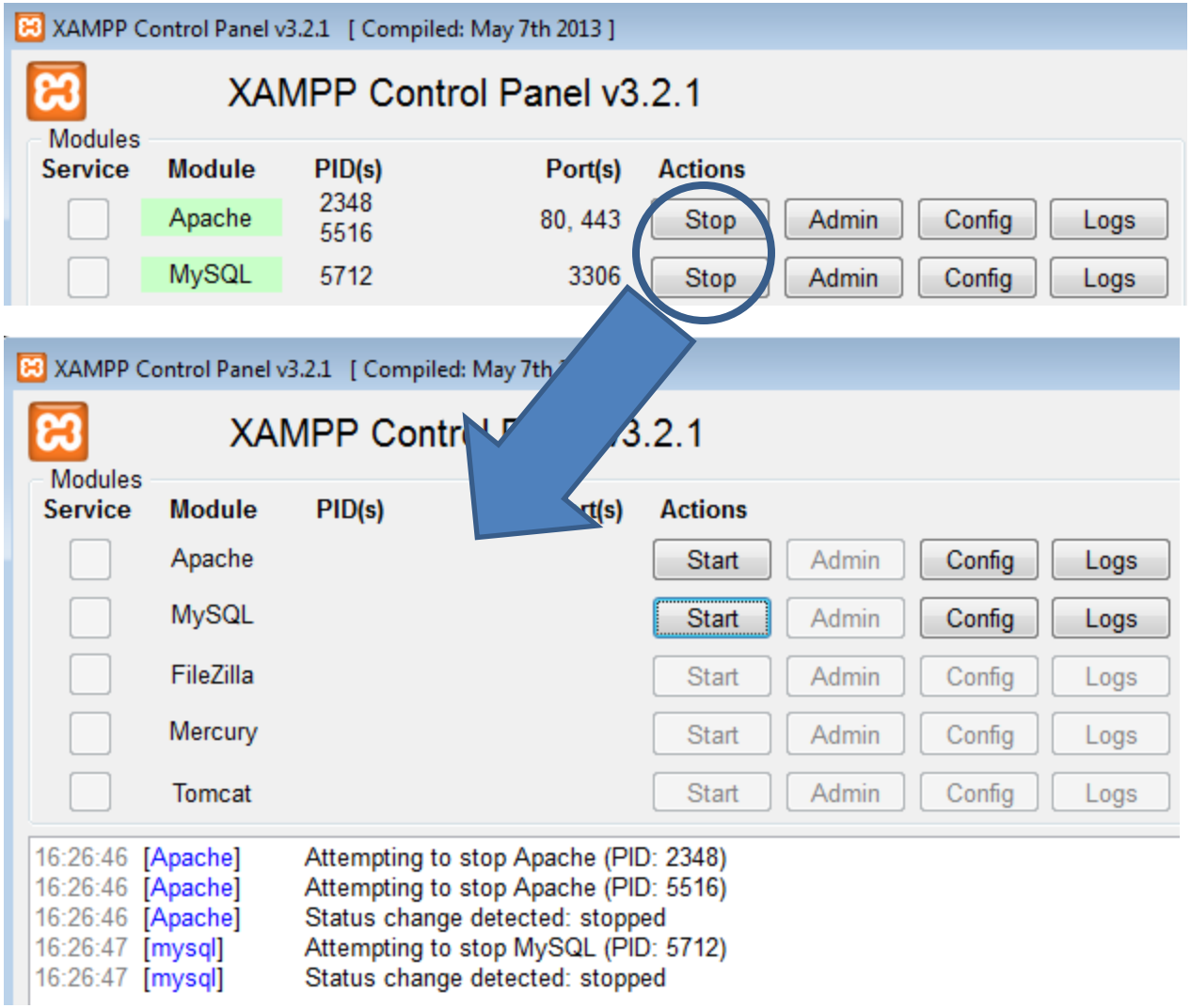
MySQL

- If you only need MySQL
- Start only MySQL:



XAMPP

- Important!!! Switch off after use!!!



This is for real!!!

- Some machines in campus are exposed to outside world.
  - Good: allow remote access from outside campus (e.g. home).
  - Bad: machines are exposed to hacker attack.
- Think your home. Got protection?
- Hackers are there 24/7 all year round.
- Hackers try different methods to gain access to your machine.

XAMPP

- XAMPP is mainly for developmental purpose.
  - There are security issues.

- Good practice:
  - Use passwords
  - have antivirus, firewall installed!
    - and know how to use them!
  - use TCPview to check who else connect to your server
  - do not start unnecessary servers (like ftp server)
  - google search: “Best Practices for Keeping Your Home Network Secure”

What is a Firewall?

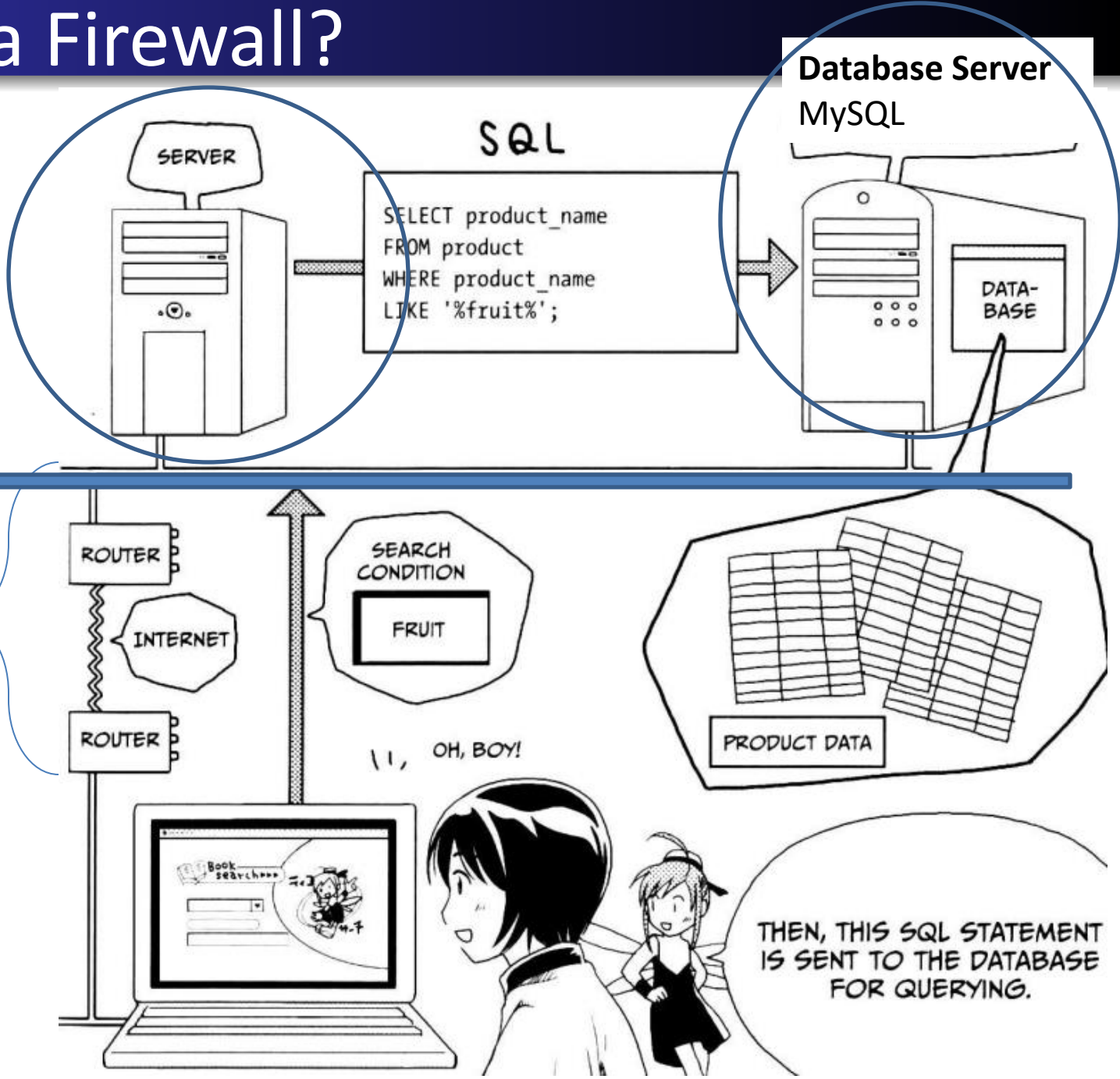
Web Server
HTTP: HTML, PHP

Firewall

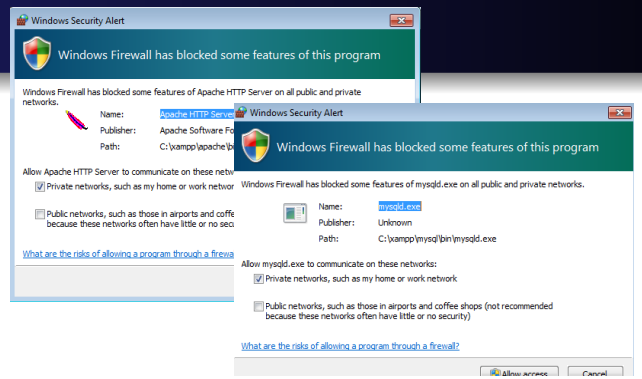
internet

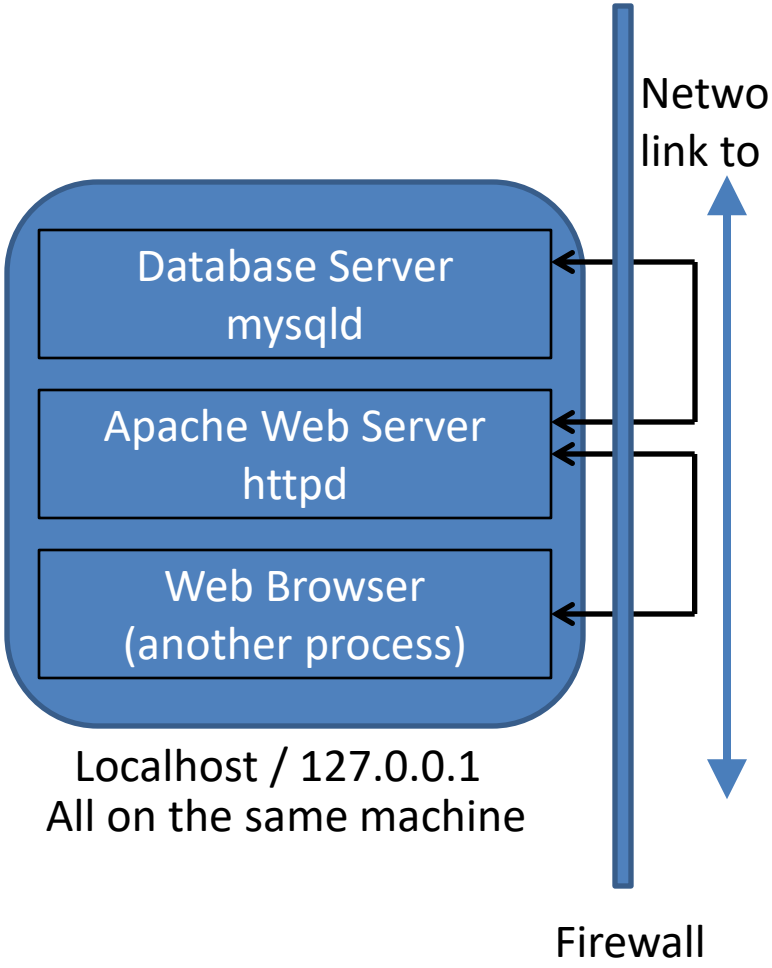
Client
Browser

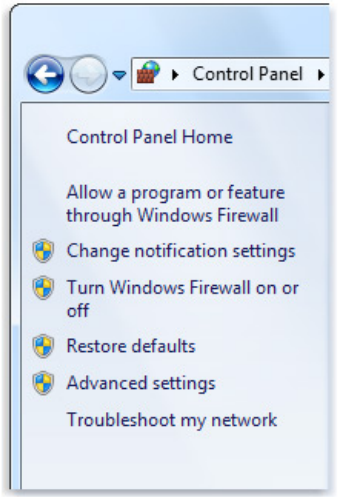
Online bookstore



Firewall / Antivirus







Microsoft Firewall
http://windows.microsoft.com/en-GB/windows7/products/features/windows-firewall

Microsoft Security
http://windows.microsoft.com/en-us/windows/security-essentials-download

Security

- You are liable to your own machine security.
- For those who are totally new to internet programming, and has no background in networking, and want max security when trying CS250 tutorial questions.
- Fool-proof method (though may sound extreme):
  - Cut the internet!!!
  - Temporarily switch off modem **during** use.
  - Temporarily switch off router **during** use.
  - Temporarily switch off WIFI **during** use.
  - Switch off mysql and apache **after** use.

No excuses!

- “Forgetting the password” is not an excuse for late coursework submission!!!
- “Your machine has been hacked” is not an excuse for late coursework submission!!!
- “Your coursework was stolen” is not an excuse for plagiarism.
- Do not hack others!

Self-Labs

- Continue MySQL and PHP (discuss in wk4, wk5)

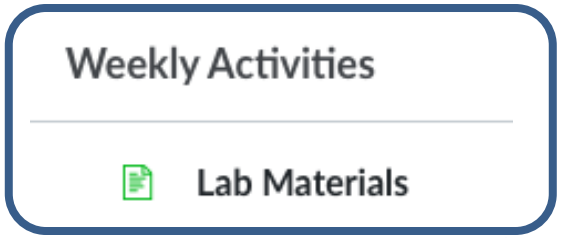
II) Working with MySQL

- simply follow MySQL.pdf, then you can try Self-Lab1-4.

III) Working with PHP example

- follow these files as instructed: PHP.pdf, example.zip
- this prepares you for the last part of CW2
- Tip: understand and ***modify*** the ***last*** PHP example for CW2!

Available from wk3 onwards:



- And Do the Self-Labs (submit to PAs)

Part3: Self-Labs 1-4 and Peer Assessments

There are four Self-labs 1-4 for your better understanding of MySQL.

It does not require PHP.

Self-Lab1: Lab1_qn.pdf Lab 1_qn.docx (PA5 =Lab1+Ex5)

Self-Lab2: Lab2_qn.pdf Lab 2_qn.docx (PA6 =Lab2+Ex6)

Self-Lab3: Lab3_qn.pdf Lab 3_qn.docx (PA10)

Self-Lab4: Lab4_qn.pdf Lab 4_qn.docx (PA10)

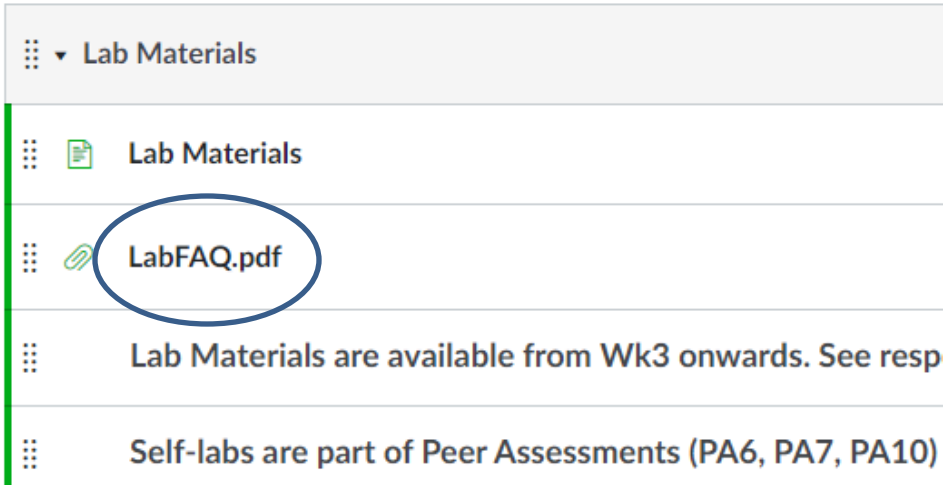
When you have done all these, please submit it to respective PAs.

These ***ALL*** prepare you for ***CW2 and exam***. Please action now without delay.

XAMPP Troubleshoot

- If you encounter issues, have a look.

LabFAQ.pdf:
https://canvas.swansea.ac.uk/courses/24913/files/2377763



- Report on discussion board etc.
- Or come to ***optional*** labs.

Gary, and demonstrator(s)
Venue: SoM 128 PC Lab (Bay)
Date: 31 Oct 2024 (Thur)
Time: 3pm-4pm, 4pm-5pm
Task: XAMPP-OptLab.pdf

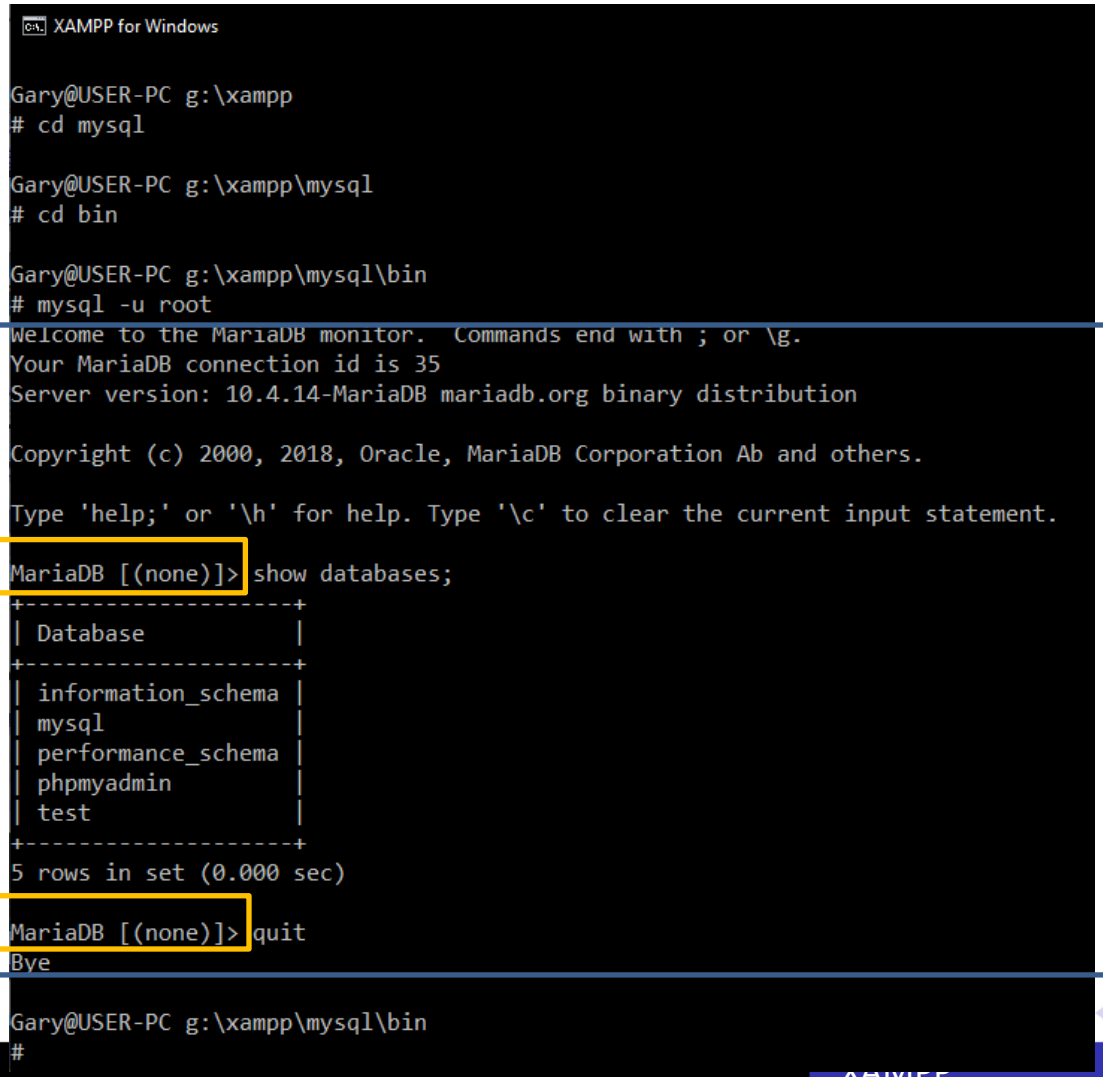
XAMPP Common Issues / FAQ

- Most students do not have any issues.
- If you experience issues, here we list some common issues with XAMPP installation.
  - How to tell if I am in console / in MySQL?
  - Change MySQL Password?
  - PHPMyAdmin issues after password change.
  - Cannot start XAMPP process (httpd/mysqld)
  - Further issues

XAMPP-Testing (Common mistakes)

- How to tell if I am in console / in MySQL?

Within MySQL



In Window console, the prompt #

Note, within MySQL Prompt is changed to: MariaDB […]>

In older version, it states MySQL […]>

You are now back to console, see the prompt #

XAMPP Common Issues / FAQ

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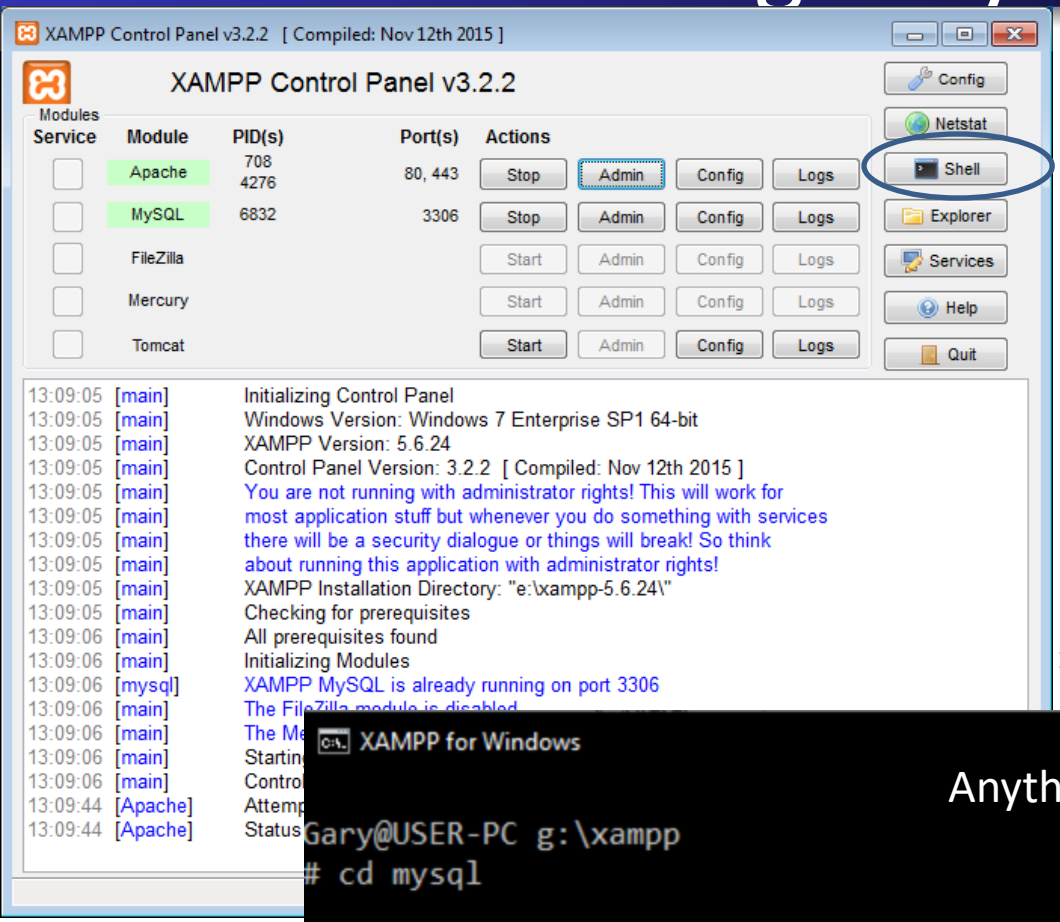
XAMPP – Change MySQL Password



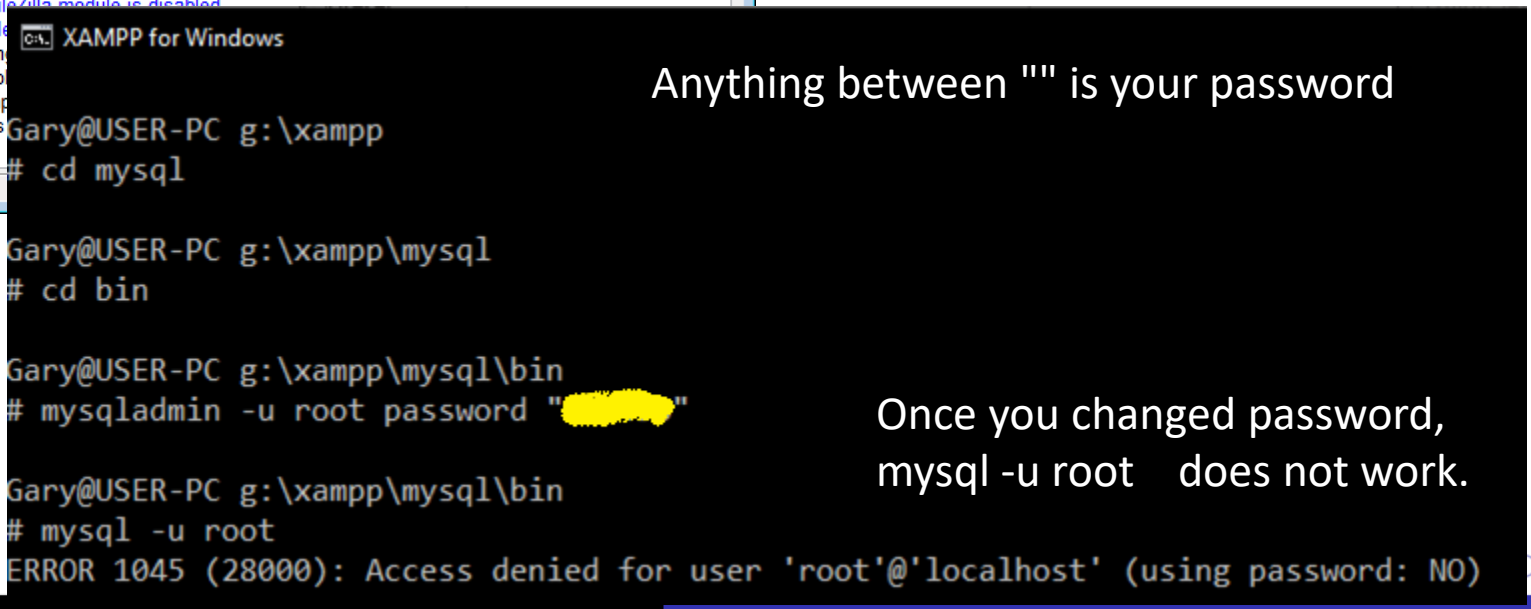
MySQL by default comes with NO PASSWORD.

Change MySQL Password:

Click Shell

Type the following in the shell

```
cd mysql
cd bin
mysqladmin -u root password "<newpwd>"
```



Anything between "" is your password

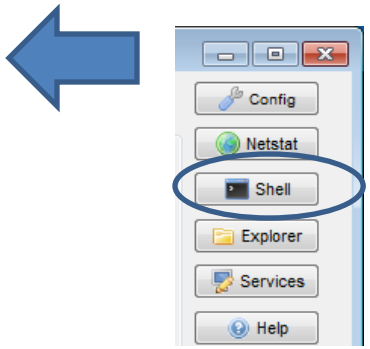
Once you changed password, mysql -u root does not work.

XAMPP – Change MySQL Password

XAMPP for Windows

Instead, you need to add -p parametr

```
Gary@USER-PC g:\xampp\mysql\bin
# mysql -u root -p
Enter password: ******
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 37
Server version: 10.4.14-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| phpmyadmin         |
| test               |
+--------------------+
5 rows in set (0.000 sec)

MariaDB [(none)]> quit
Bye

Gary@USER-PC g:\xampp\mysql\bin
# _
```



Type these instead:

(if not in bin folder)

```
cd mysql
cd bin
```

Use these from now on:

```
mysql -u root -p
<then your new pwd>
```

XAMPP – Troubleshoot PHPMyAdmin

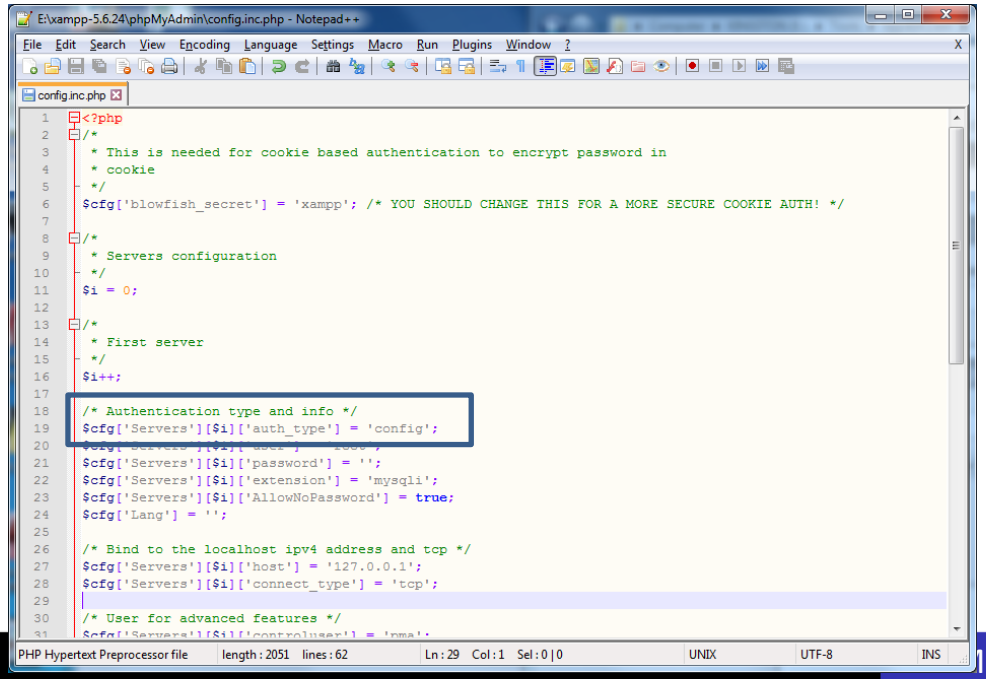
- CS250 does ***NOT*** require PHPMyAdmin.
- and recommend you ***not*** to use it on CWs. However, if you insist, and if you have changed password…
- Issues arise ***IF you set a password*** in MySQL database…

Modify xampp\phpMyAdmin\config.inc.php

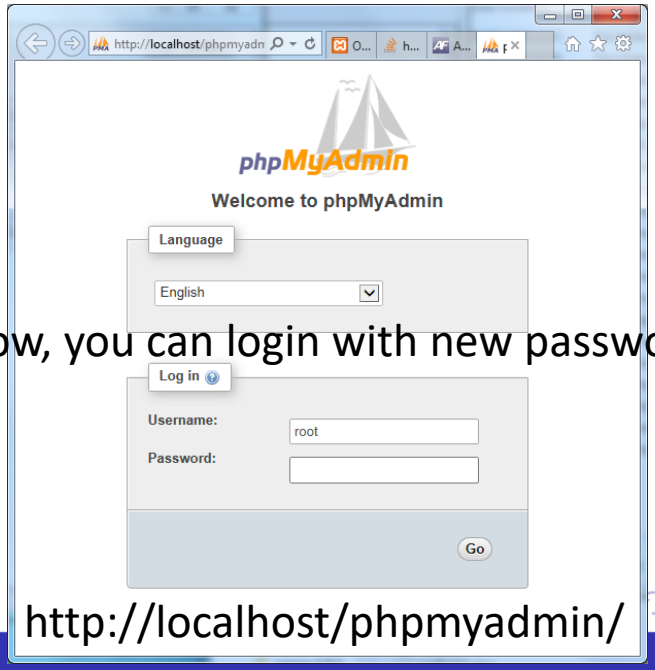
Change the line:

```
/* Authentication type and info */
$cfg['Servers'][$i]['auth_type'] = 'config';
```

```
/* Authentication type and info */
$cfg['Servers'][$i]['auth_type'] = 'cookie';
```



Now, you can login with new password



http://localhost/phpmyadmin/

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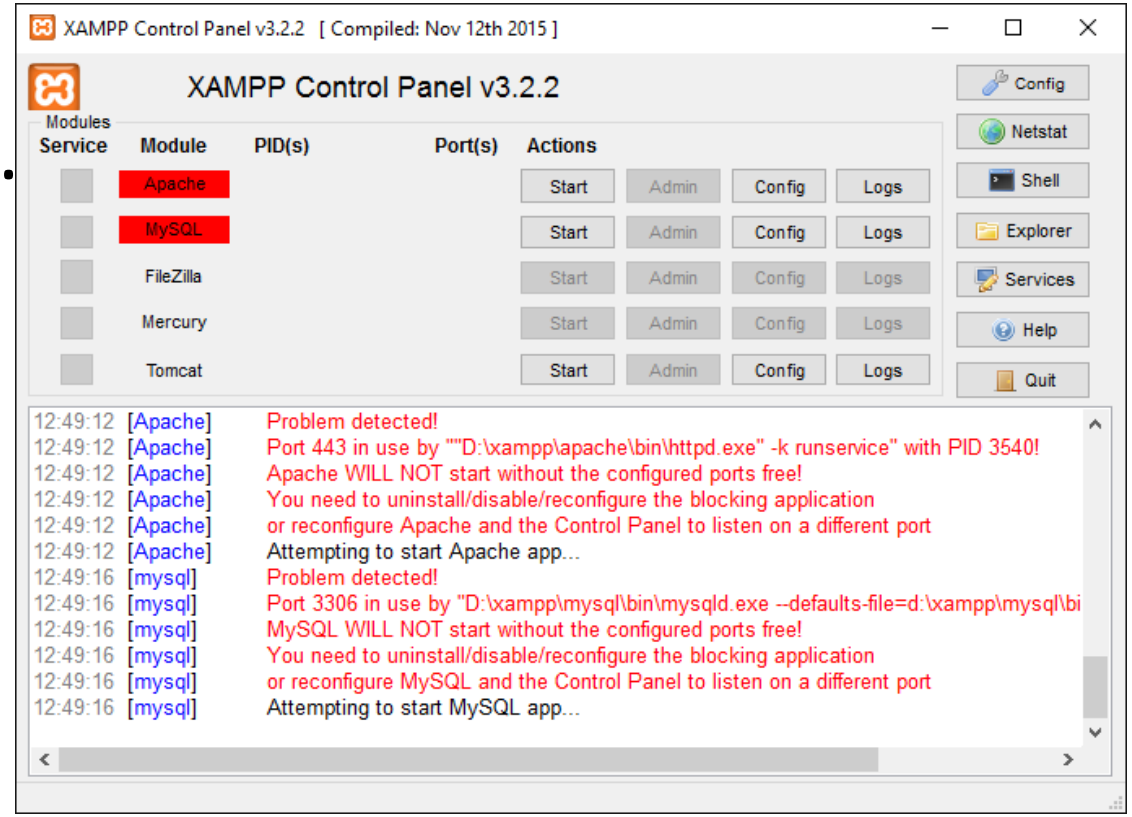
XAMPP – Troubleshoot (1)

- The processes cannot be started.

Try run again: setup_xampp.bat
Restart XAMPP, and try again.



- Possible errors at home/laptop.

Some process are likely using port 80 (http), 443 (https), or 3306 (mysql).
It would be Windows' WWW Publishing Service, Skype etc.
Read these: http://stackoverflow.com/questions/27333203/xampp-couldnt-start-apache-windows-10

Find the process and kill them using ProcessXP and TCPView.

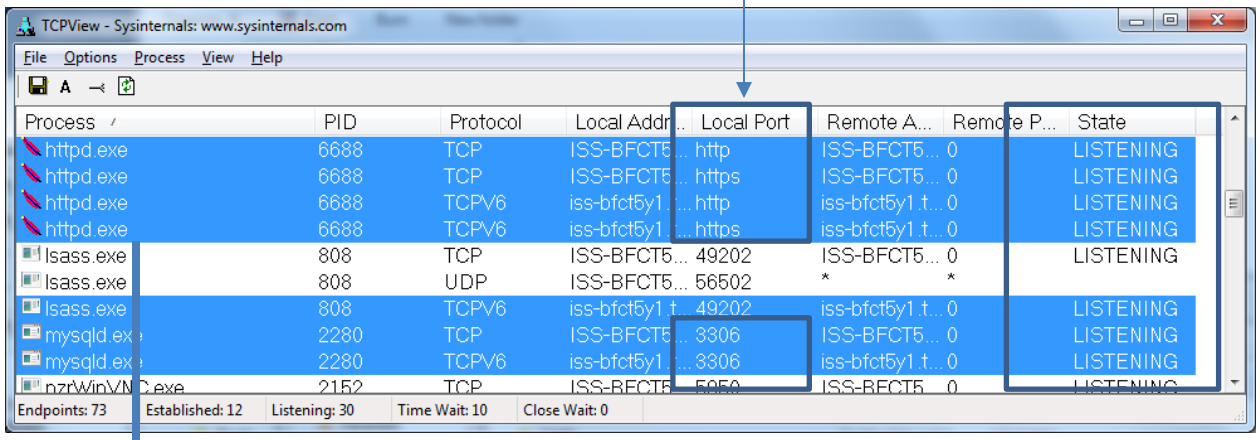
XAMPP - Troubleshoot (1)

Tool: TCPView

https://technet.microsoft.com/en-us/sysinternals/tcpview.aspx

Look into LocalPort Column

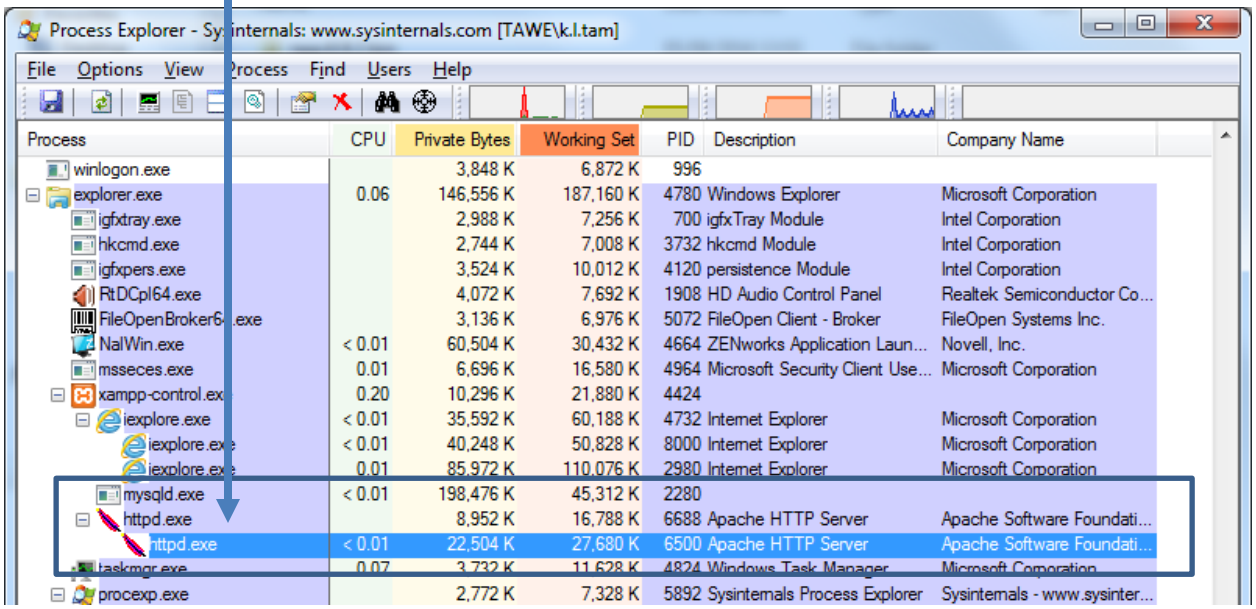
See what are using the ports!



Tool: ProcessXP

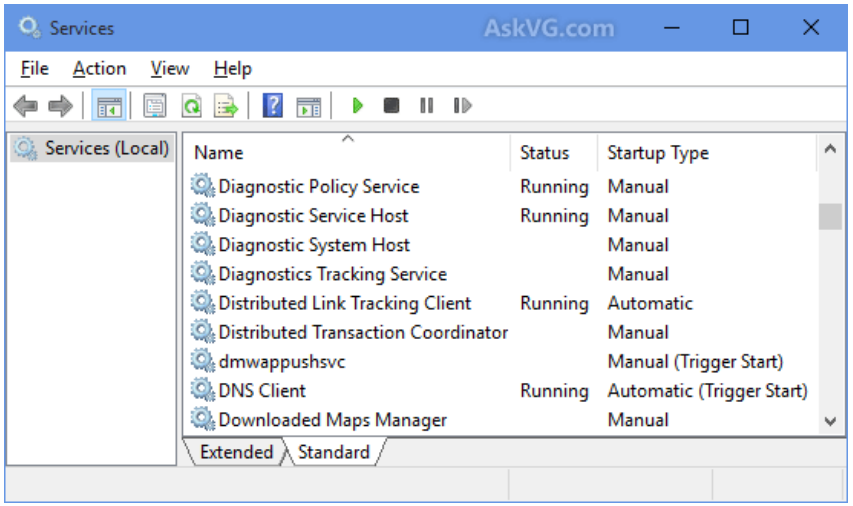
https://technet.microsoft.com/en-us/sysinternals/processexplorer.aspx

port 80 (http), 443 (https), or 3306 (mysql)



XAMPP - Troubleshoot (1)

- If TCPView / Process XP review the culprit is a "System Process", then it means Microsoft is the one to be blamed.
- Common culprit:
  - World Wide Web Publishing Service
  - IIS (ASP server)
  - SQL Server Reporting Services
  - Skype
  - Microsoft-HTTPAPI/2.0
  - Web Deployment Agent Service
  - MySQL server (you install it separately?)



- To turn off services that you do not want in windows you go to
- Start > Run > Type: ‘services.msc’
- Double Click on the service you want to alter and change the startup type to ***disabled*** or ***manual***; and click ***stop*** to stop the process.
- And/Or uninstall them.
  - For example, MySQL server conflicts with XAMPP. Uninstall it / Change port.
  - To change port, there are some instructions in ***option 4 (lab machine setup)***.

https://www.sitepoint.com/unblock-port-80-on-windows-run-apache/
http://stackoverflow.com/questions/30758894/apache-server-xampp-doesnt-run-on-windows-10-port-80
https://www.sitepoint.com/unblock-port-80-on-windows-run-apache/
http://www.askvg.com/beginners-guide-to-configure-windows-10-services/

XAMPP - Troubleshoot (2)

- If apache (httpd) / mysql (mysqld) processes still cannot run

- Two more things you can try:

1) Do you have additional firewall / antivirus other than Microsoft Firewall/Defender? Sometimes these firewall / antivirus software block these processes due to security reasons.
   - For Norton Antivirus/Firewall, there is a way to “trust” processes.

   https://support.norton.com/sp/en/uk/home/current/solutions/v6958602

   (You may have others brand of firewall/antivirus. Google it to find out.)

2) Try putting XAMPP folder to the root of the drive. Sometimes it help.
   - For example, put it under G:\XAMPP, H:\XAMPP
   - If you mainly use XAMPP on your laptop/desktop, and need not be portable, put them under C:\XAMPP, D:\XAMPP
   - Issues: “space” in the relative path or “non-English encoding”.

XAMPP - Troubleshoot (3)

- Sometimes XAMPP reports error messages from PHP
  - missing .dll / cannot find .dll etc?

- You may want to try installing Microsoft Visual C++ Redistributable. (Download the latest one both 32bit and 64 bits)
- https://learn.microsoft.com/en-us/cpp/windows/latest-supported-vc-redist

- PHP was built using VC++ on window platform and it depends on some redistributable libraries (pre-complied standard libraries). These redistributable may be installed by some Games already. For new clean machines, these may not be available.
- Download and install redistributable, restart machine, try again.

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XAMPP – Further Issues

- If you still have problems installing XAMPP.
  - Google it – most common problems are answered by the web
  - Post on discussion board with **screenshot**
    see if Gary/Tutor/peers can help
- If you still have problems installing XAMPP ***after 3 days***
  - ***DO NOT WASTE TIME***
  - Follow Option 4,
  - USE lab machines,
    follow specific instructions

Gary, and demonstrator(s)
Venue: SoM 128 PC Lab (Bay)
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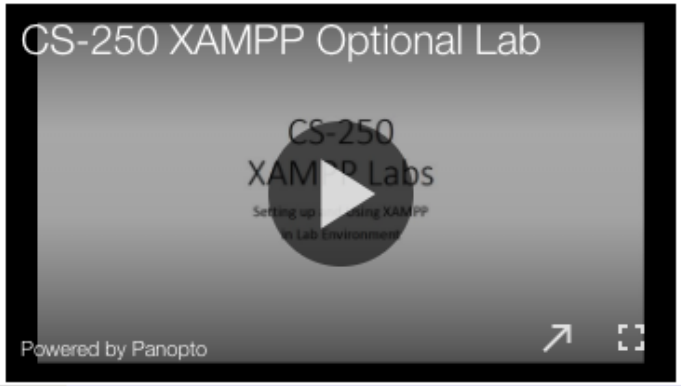
- **4. Computational Foundry Lab environment (Win10 machines):**
  - You need to access a Lab PC machine physically. Two ways:
    1. come back to campus, find a PC in lab physically; or
    2. access a PC remotely
       - See this document provided by ISS: Remote Access to PC in Labs.pdf
       - You need to config your account, install and set up Microsoft authenticato
  - next, follow XAMPP_OptLab.pdf
  - Here is a step-by-step video of the XAMPP_OptLab.pdf
  - click the ↗ button to open two streams mode, and the click ⇄ to swap the v