Lecture 8 (w10)

2023/2024

Databases, Web Programming and Interfacing

DWPI

- Databases, Web Programming and Interfacing
  - An VI IT4T
    - 1C/1L/1P
- Timetable
  - Friday, every week (fiecare saptamana) 1C + 2L (17-20)
  - Friday, 12/02/2022 rescheduled (UTI) → Saturday 12/10/2022 same hours

Email addresses

- Team representative
  - list of **active** email addresses for all students
    - can be @student.etti.tuiasi.ro (also @gmail @yahoo etc.)
  - **rdamian@etti.tuiasi.ro**

Grade

- 10% - Test/Examen – last week – 1h
- 40% - **Personal**/Team Project

Info

- http://rf-opto.etti.tuiasi.ro/master_it.php

Access

- ~~Not customized~~

Date:

Grupa	5304 (2015/2016)
Specializarea	Tehnologii si sisteme de telecomunicatii
Marca	5184

Acceseaza ca acest student

Note obtinute

Disciplina	Tip	Data	Descriere	Nota	Puncte	Obs.
TW	Tehnologii Web					
	N	17/01/2014	Nota finala	10	-	
	A	17/01/2014	Colocviu Tehnologii Web 2013/2014	10	7.55	
	B	17/01/2014	Laborator Tehnologii Web 2013/2014	9	-	
	D	17/01/2014	Tema Tehnologii Web 2013/2014	9	-	

Nume

Email

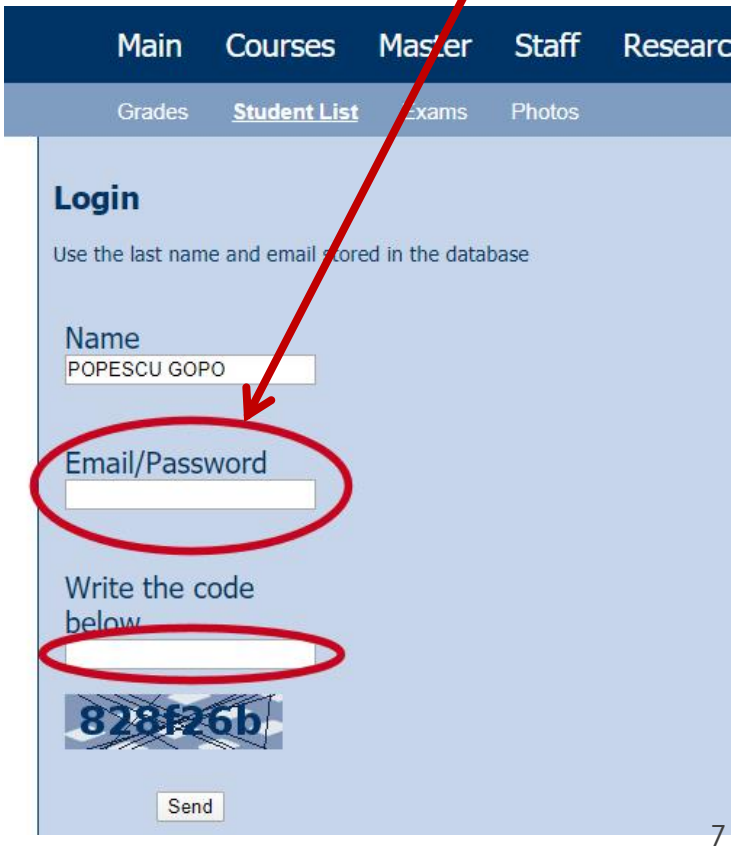
Cod de verificare

344bd9f

Trimite

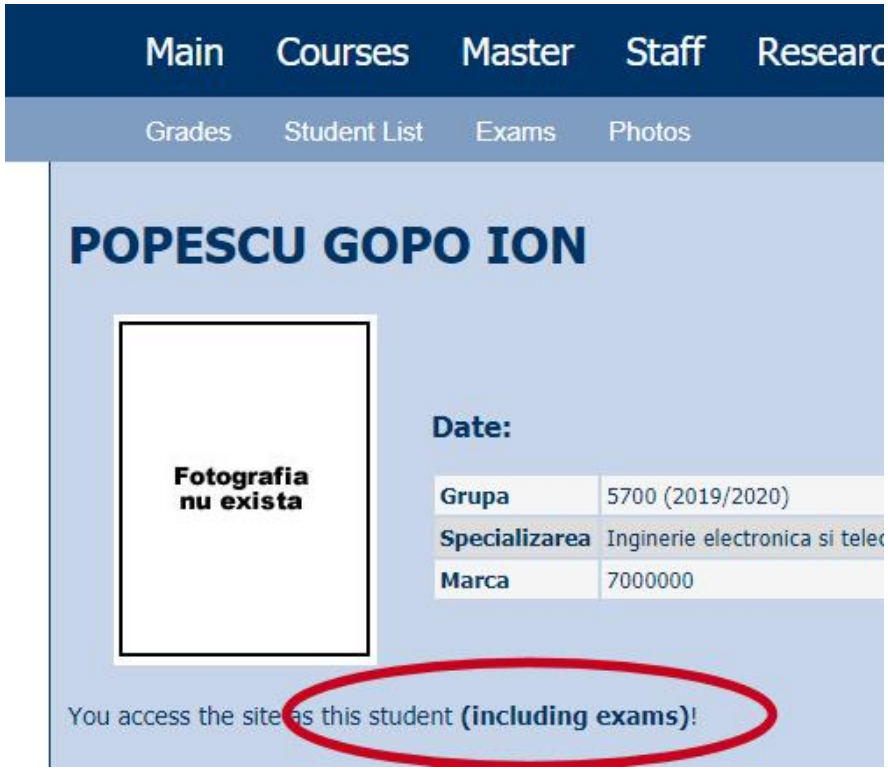
Online

- access to **online exams** requires the **password** received by email



Online

- access email/password



Password

- received by email

Important message from RF-OPTO Inbox ×

Radu-Florin Damian
to me, POPESCU

Romanian > English Translate message

Laboratorul de Microunde si Optoelectronica
Facultatea de Electronica, Telecomunicatii si Tehnologia Informatiei
Universitatea Tehnica "Gh. Asachi" Iasi

In atentia: POPESCU GOPO ION

Parola pentru a accesa examenele pe server-ul **rf-opto** este
Parola: [redacted]

Identificati-va pe server, cu parola, cat mai rapid, pentru confirmare.

Memorati acest mesaj intr-un loc sigur, pentru utilizare ulterioara

---

Attention: POPESCU GOPO ION

The password to access the exams on the **rf-opto** server is
Password: [redacted]

Login to the server, with this password, as soon as possible, for confirmation.

Save this message in a safe place for later use

Reply Reply all Forward

Subject	Correspondents
Important message from RF-OPTO	POPESCU GOPO ION
Validation of MDCR exam from 02/05/2020	[redacted]
[redacted]	[redacted]

From Me <rdamian@etti.tuiasi.ro>
Subject **Important message from RF-OPTO**
To [redacted]
Cc Me <rdamian@etti.tuiasi.ro>

Laboratorul de Microunde si Optoelectronica
Facultatea de Electronica, Telecomunicatii si Tehnologia Informatiei
Universitatea Tehnica "Gh. Asachi" Iasi

In atentia: POPESCU GOPO ION

Parola pentru a accesa examenele pe server-ul **rf-opto** este
Parola: [redacted]

Identificati-va pe server, cu parola, cat mai rapid, pentru confirmare.

Memorati acest mesaj intr-un loc sigur, pentru utilizare ulterioara

---

Attention: POPESCU GOPO ION

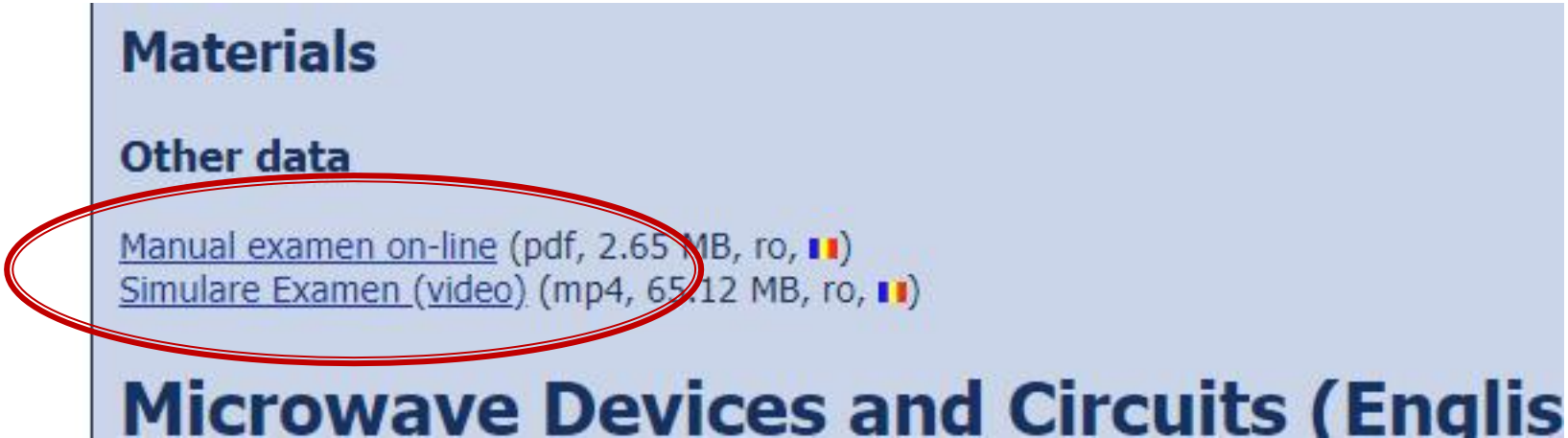
The password to access the exams on the **rf-opto** server is
Password: [redacted]

Login to the server, with this password, as soon as possible, for confirmation.

Save this message in a safe place for later use

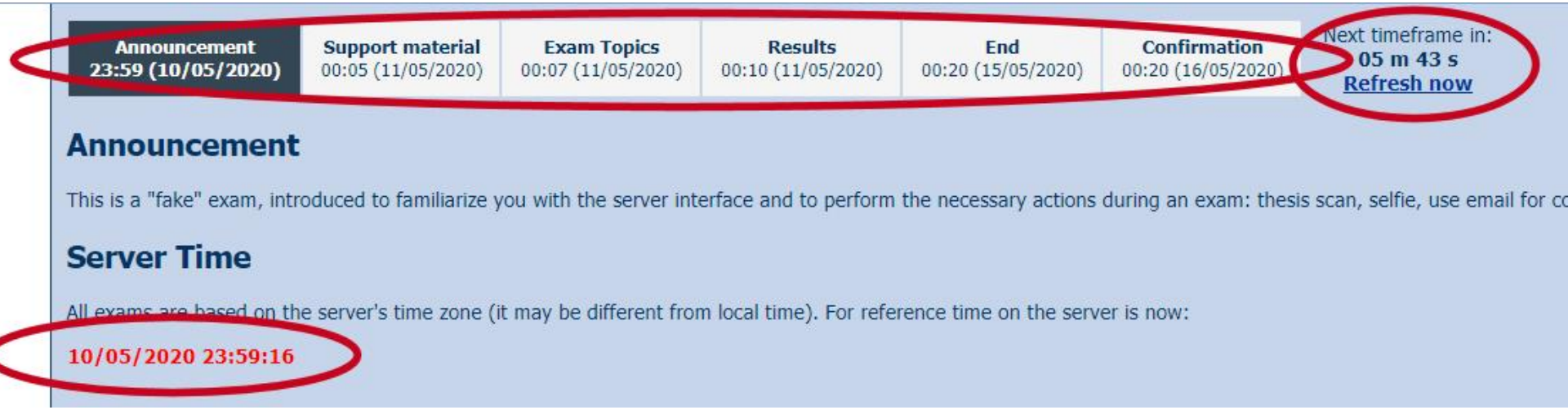
Manual examen online

- The online exam app used for:
  - lectures (attendance)
  - laboratory
  - project
  - examinations



Examen online

- always against a **timetable**
  - long period (lecture attendance/laboratory results)
  - short period (tests: 15min, exam: 2h)



2022/2023

Project

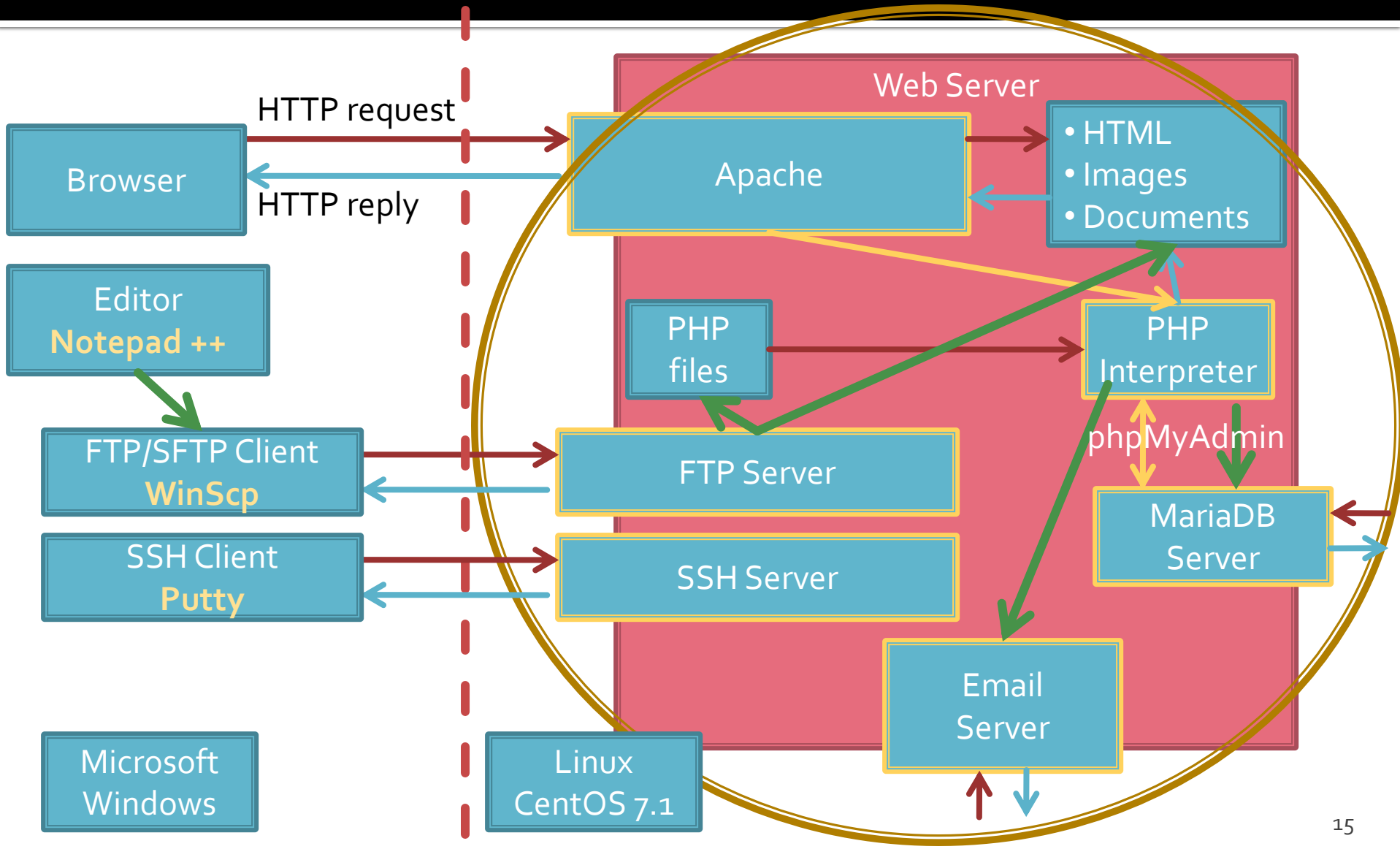
Project

- Submission: **On-site**
- Presentation (in front of the colleagues) + files submission
- 3 files
  - **1 *.pdf** (print-screen while using the application, short usage instructions, a mini-user manual for the application)
  - **1 *.sql** (backup of the database required to run the application)
  - archive of the application (inside: files *.php, *.jpg, folder tree etc., archived: ***.zip, *.7z** etc.)

Project grading

- **(2p)** the application runs on the **reference server** (can be downloaded from rf-opto: Ubuntu, php 7 or CentOS 7, php 5): extract files from the ***.zip** archive in a folder on the server, restore database from the ***.sql** backup file
- **(2p)** the ***. pdf** file containing the user manual exists and is appropriate for the submitted application
- **(2p)** the application **flowchart** has been submitted and contains appropriate data
- **(4p)** presentation on-site of the **application**

Using LAMP


HTTP request
HTTP reply
Browser
Editor
Notepad ++
FTP/SFTP Client
WinScp
SSH Client
Putty
Microsoft Windows
Linux CentOS 7.1
Web Server
Apache
• HTML
• Images
• Documents
PHP files
PHP Interpreter
phpMyAdmin
FTP Server
SSH Server
MariaDB Server
Email Server

Reference Server

- rf-opto.etti.tuiasi.ro > Master > Web Design

Project/Design

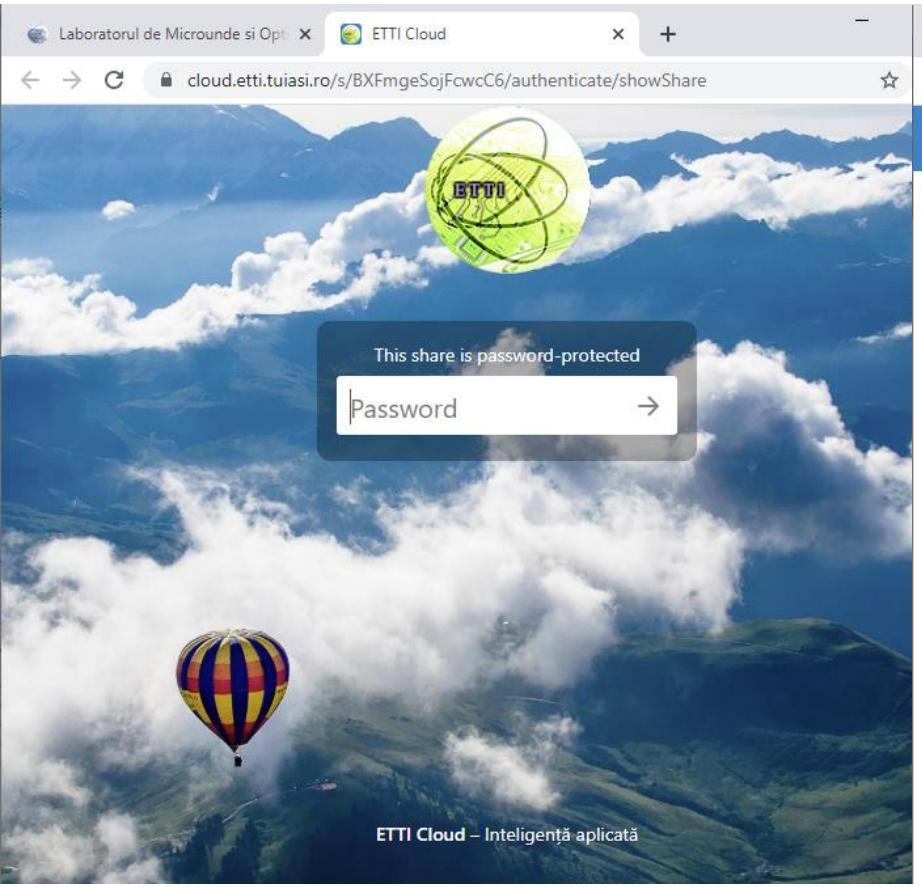
VMware Workstation Player (link, 0 Bytes, en,)
Ubuntu VM for VMWare (link, 0 Bytes, en,)
Ubuntu Setup (pdf, 1.83 MB, en,)
Centos VM for VMWare (link, 0 Bytes, en,)
Centos Setup (pdf, 2.54 MB, en,)

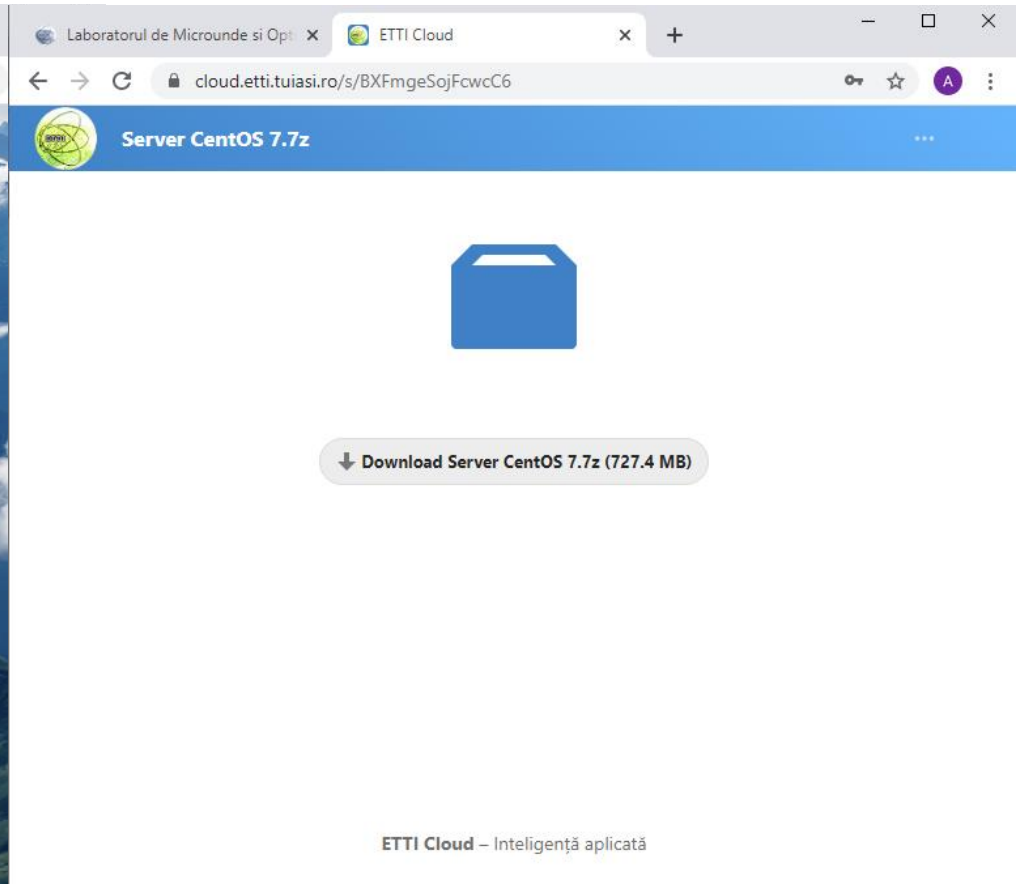
Examen

Online Exam manual (pdf, 2.56 MB, en,)
Manual examen on-line (pdf, 2.65 MB, ro,)

Reference Server

- Cloud ETTI: **RF-opto3#**

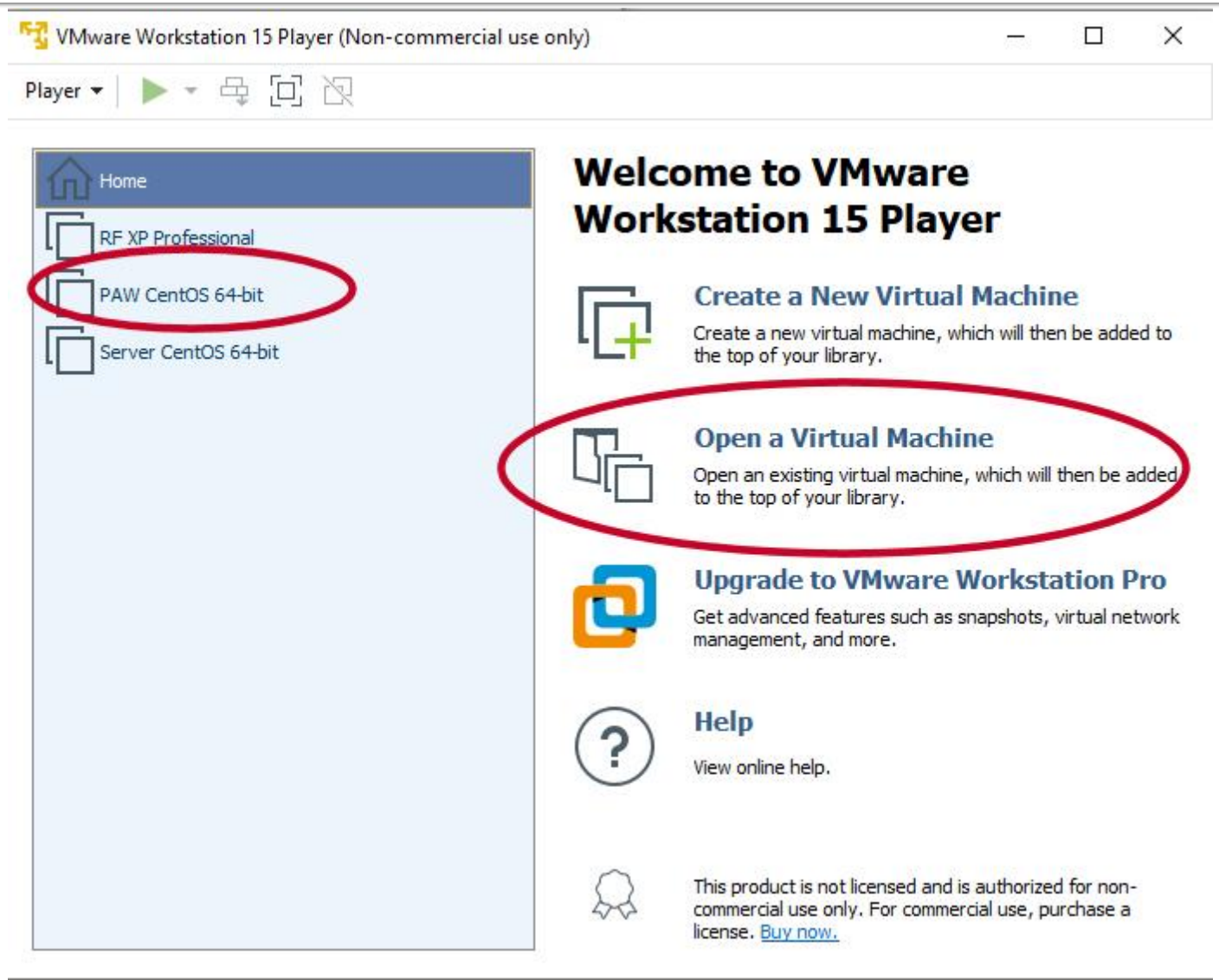




Reference Server

- Virtual Machine
- VMware Workstation Player Windows/Linux
  - Free (non-commercial use)
  - https://www.vmware.com/products/workstation-player/workstation-player-evaluation.html

Reference Server



Possible problems

- Current VMWare Player runs **only** on **64bit** operating systems Windows/Linux
  - for 32bit operating systems previous (**certified originals**) can be made available on rf-opto
- The host computer **must** enable **Hardware Virtualization**
  - Hardware Virtualization is enabled in BIOS, depending on the PC manufacturer: Processor, Chipset, Northbridge
  - Options name: VT-x, AMD-V, Vanderpool, Hyper-V, SVM, Intel Virtualization Technology. if available: Intel VT-d, AMD IOMMU
- VM archive requires **7zip** native to the target operating system

Support applications

- WinSCP (FTP client, free)
  - https://winscp.net/eng/download.php
- Notepad ++ (text editor, advanced, free)
  - https://notepad-plus-plus.org/downloads/
- Putty (remote access)
  - https://www.putty.org/
- MySQL Workbench (gratuit, cont Oracle)
  - https://www.mysql.com/products/workbench/

IP address

- login, ifconfig
- Ctrl + Alt + mouse

PAW CentOS 64-bit - VMware Workstation 15 Player (Non-commercial use only)

Player

```
CentOS Linux 7 (Core)
Kernel 3.10.0-229.20.1.el7.x86_64 on an x86_64

tmpaw login: root
Password:
Last login: Wed Jun 17 05:35:16 from 192.168.0.106
[root@tmpaw ~]# ifconfig
```

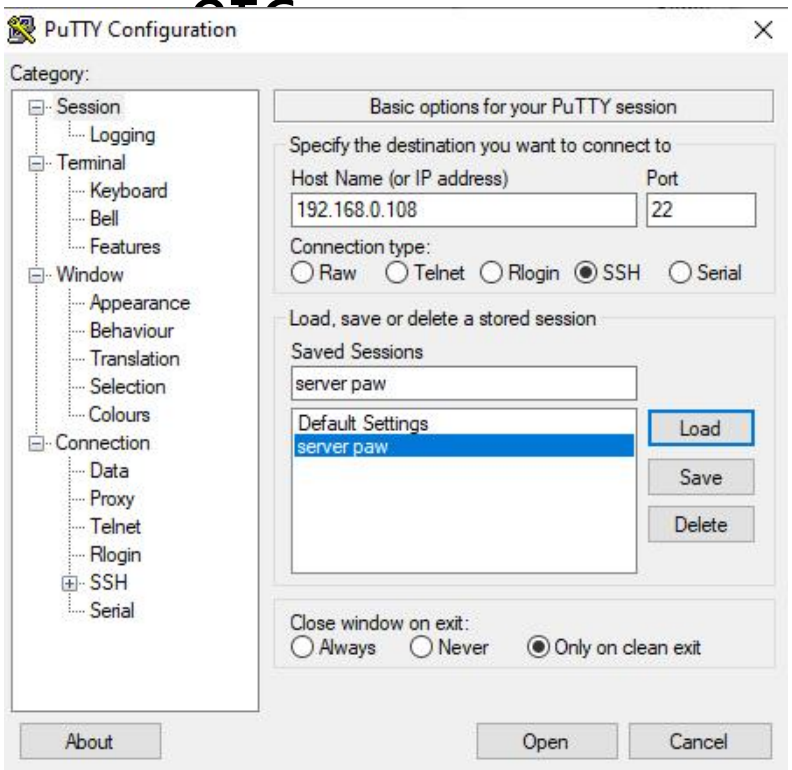
PAW CentOS 64-bit - VMware Workstation 15 Player (Non-commercial use only)

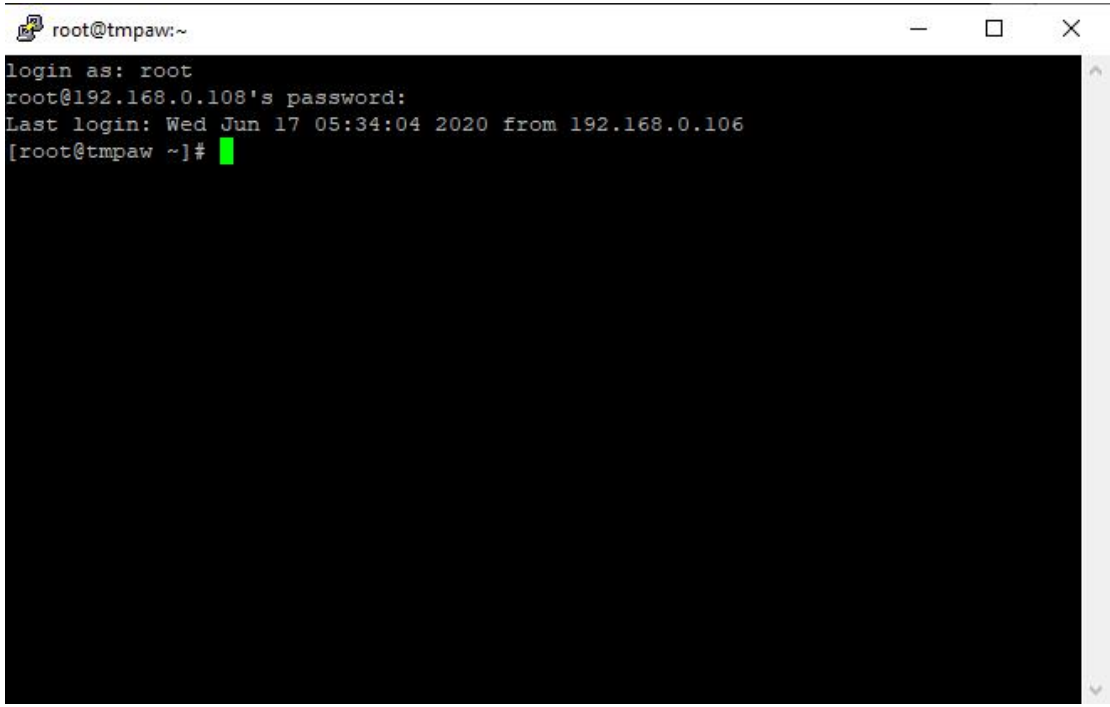
Player

```
CentOS Linux 7 (Core)
Kernel 3.10.0-229.20.1.el7.x86_64 on an x86_64

tmpaw login: root
Password:
Last login: Wed Jun 17 05:35:16 from 192.168.0.106
[root@tmpaw ~]# ifconfig
eno16777736: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.0.108  netmask 255.255.255.0  broadcast 192.168.0.255
        inet6 fe80::250:56ff:fe3e:1693  prefixlen 64  scopeid 0x20<link>
        ether 00:50:56:3e:16:93  txqueuelen 1000  (Ethernet)
        RX packets 104  bytes 12814 (12.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 99  bytes 11847 (11.5 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 0  (Local Loopback)
        RX packets 16  bytes 1774 (1.7 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 16  bytes 1774 (1.7 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

[root@tmpaw ~]# _
```

Putty

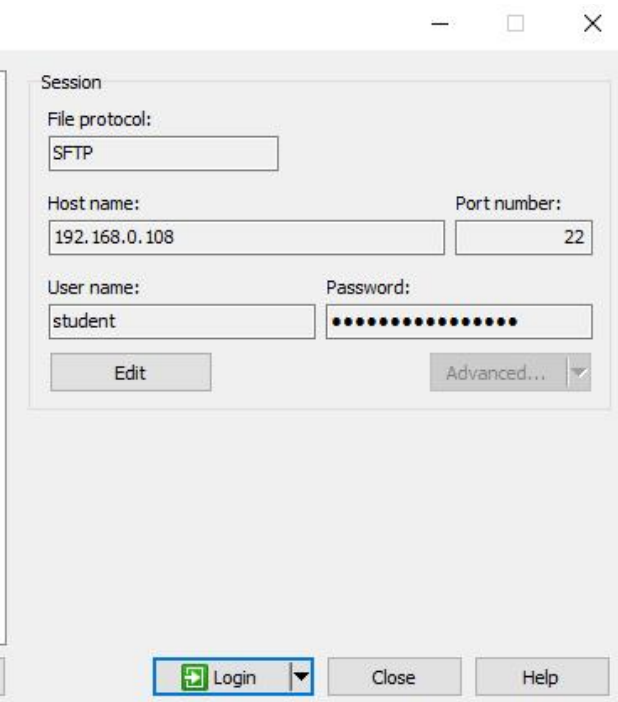
- putty.exe
- avoids mouse capture (CentOS), copy/paste etc

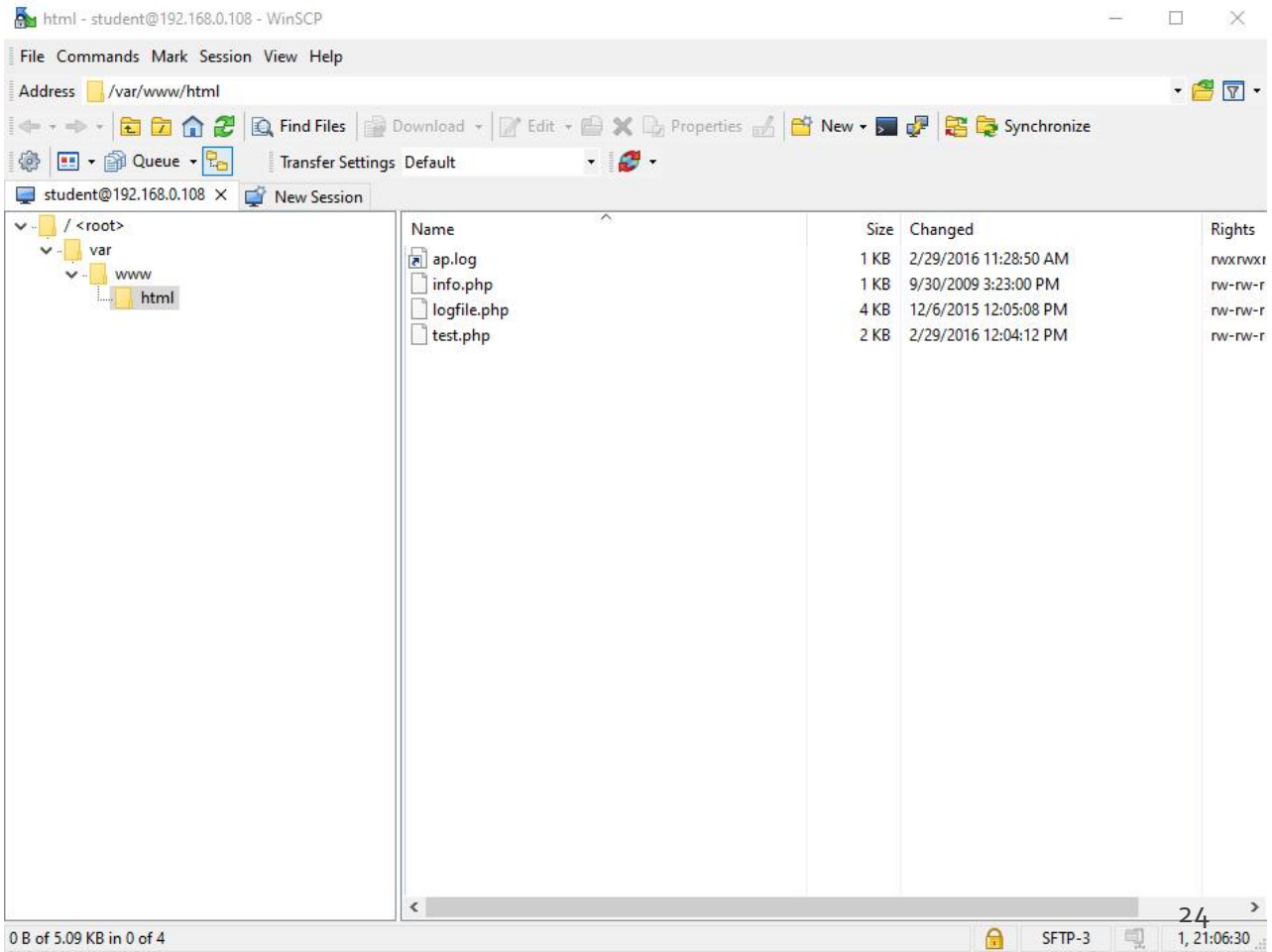




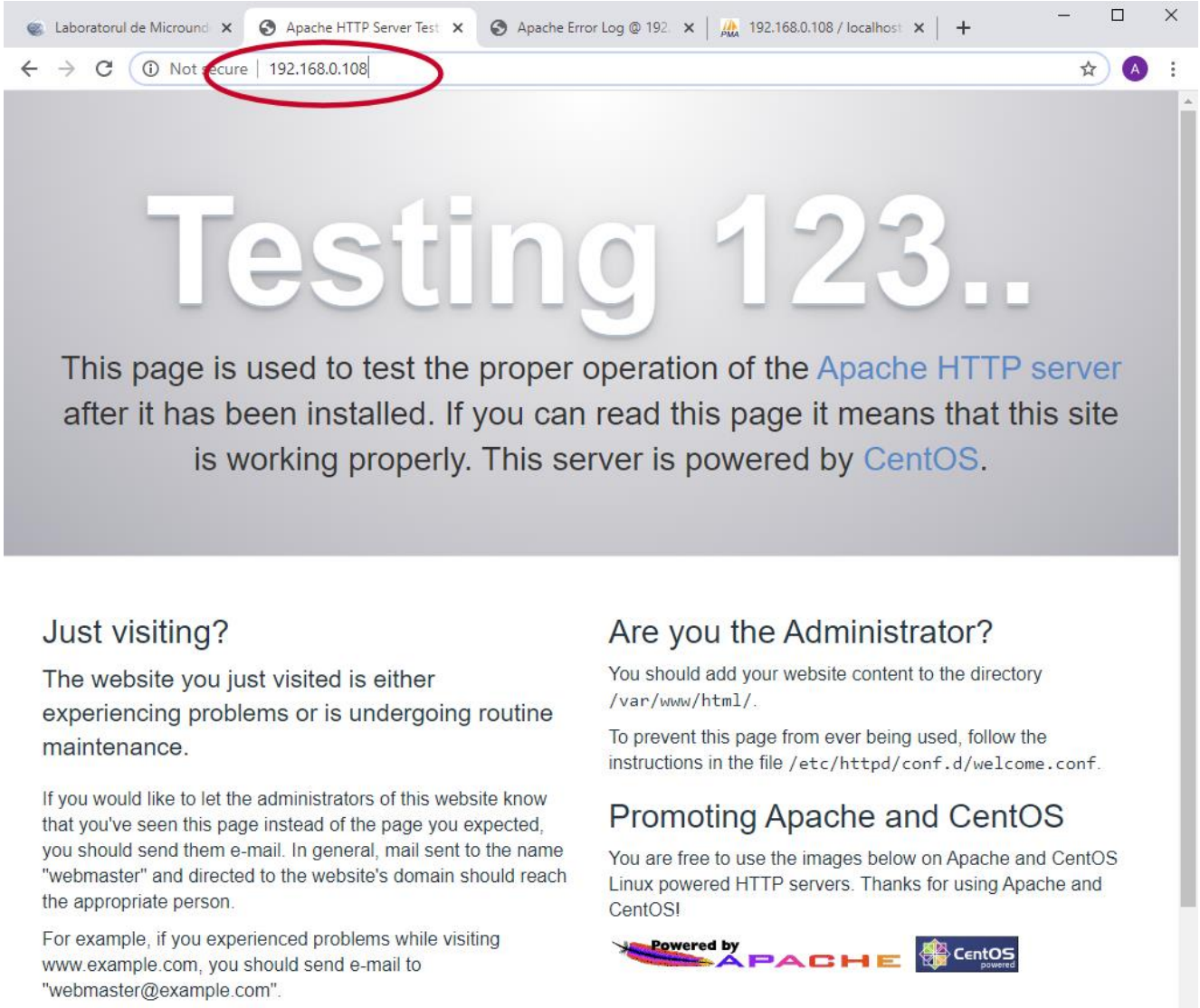
WinSCP

- FTP client
- upload files





Browser


Laboratorul de Micround
Apache HTTP Server Test
Apache Error Log @ 192
192.168.0.108 / localhost
Not secure
192.168.0.108
Testing 123..
This page is used to test the proper operation of the Apache HTTP server after it has been installed. If you can read this page it means that this site is working properly. This server is powered by CentOS.
Just visiting?
The website you just visited is either experiencing problems or is undergoing routine maintenance.
If you would like to let the administrators of this website know that you've seen this page instead of the page you expected, you should send them e-mail. In general, mail sent to the name "webmaster" and directed to the website's domain should reach the appropriate person.
For example, if you experienced problems while visiting www.example.com, you should send e-mail to "webmaster@example.com".
Are you the Administrator?
You should add your website content to the directory /var/www/html/.
To prevent this page from ever being used, follow the instructions in the file /etc/httpd/conf.d/welcome.conf.
Promoting Apache and CentOS
You are free to use the images below on Apache and CentOS Linux powered HTTP servers. Thanks for using Apache and CentOS!
Powered by APACHE
CentOS powered

Server MySQL/MariaDB

Laboratorul de Micround | Apache HTTP Server Test | Apache Error Log @ 192 | 192.168.0.108 / localhost

Not secur | 192.168.0.108/phpmyadmin/#PMAURL-5:index.php?db=&table=&server=1&target=&token=f7dda12d42a1...

phpMyAdmin

Recent Favorites

- New
- information_schema
- mysql
- performance_schema
- tmpaw
- world

Server: localhost

Databases | SQL | Status | Users | Export | Import | Settings | More

General Settings

Change password

Server connection collation: utf8mb4_unicode_ci

Appearance Settings

Language: English

Theme: pmahomme

- Font size: 82%

More settings

Database server

- Server: Localhost via UNIX socket
- Server type: MariaDB
- Server version: 5.5.44-MariaDB - MariaDB Server
- Protocol version: 10
- User: root@localhost
- Server charset: UTF-8 Unicode (utf8)

Web server

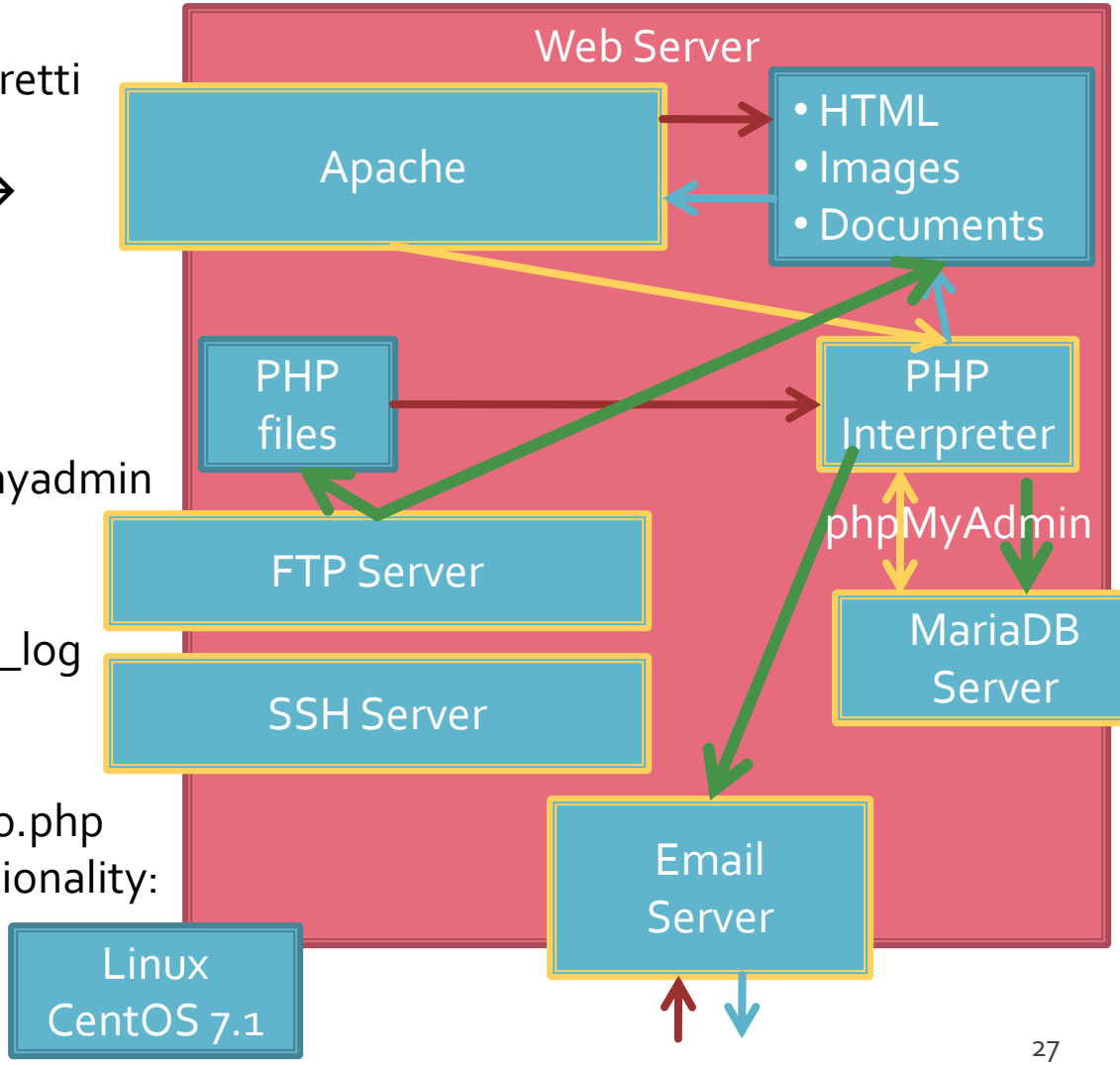
- Apache/2.4.6 (CentOS) OpenSSL/1.0.1e-fips mod_fcgid/2.3.9 PHP/5.4.16 mod_python/3.5.0- Python/2.7.5
- Database client version: libmysql - 5.5.44-MariaDB
- PHP extension: mysqli
- PHP version: 5.4.16

phpMyAdmin

- Version information: 4.4.15.1
- Documentation
- Wiki
- Official Homepage
- Contribute
- Get support
- List of changes

Using LAMP

1. login → root:masterrc / paw:masteretti
2. ifconfig → 192.168.30.5
3. putty.exe → 192.168.30.5 → SSH → root:masterrc (remote login)
4. [other linux command line]
5. FTP → Winscp → SFTP → student:masterrc@192.168.30.5
6. MySql → http://192.168.30.5/phpmyadmin → root:masterrc / root:masteretti
7. Apache Error Log →
7a. putty → nano /var/log/httpd/error_log
7b. http://192.168.30.5/logfile.php (nonstandard)
8. PHP info → http://192.168.30.5/info.php
9. if DHCP service stops Apache functionality: service httpd restart



LAMP Reference Server

- Linux, two variants
  - Centos 7.1
    - PHP 5.4.16
    - MariaDB 5.5.44
    - Apache 2.4.6
    - **root**/student:masterrc
  - Ubuntu 20.04 (**recommended**)
    - PHP 7.4.3
    - MariaDB 10.3.31
    - Apache 2.4.41
    - **paw**/student:masteretti
    - correction **paw FTP access**:
      - sudo usermod -a -G upload paw
      - sudo chmod -R 775 /var/www

Introduction

Necessity

File Edit Selection View Go Run Terminal Help

Welcome | lista_lot.php 9+

E: > Documents > Pagini Web > Safir dep > lista_lot.php > html > head > script

```
535     <td><img class="taste" src="images/next.gif" alt="ok" id="ok" onclick="Update_Valoare(this.id);" /></td>
536   </tr>
537 </table>
538 </div>
539 <?php }?>
540
541 <div id="maincontent"><!-- InstanceBeginEditable name="Continut" -->
542 <p><span class="title">Adauga</span><br/>
543   <a href="control_lot.php?id=0">Lot nou</a></p>
544 <p class="title">Loturi active</p>
545 <?php
546 $query = "SELECT l.*, c.`nume_user` AS `user_creat`
547         FROM `lot` AS l
548         LEFT JOIN `users` AS c ON (l.`User`=c.`id_user`)
549         WHERE l.`Activ` <> 0 ORDER BY l.`ID_LOT` DESC";
550 $result = mysql_query($query);
551 $total=0;
552 if ($result && (mysql_num_rows($result) > 0))
553     {
554     $total=mysql_num_rows($result);
555     $row = mysql_fetch_assoc($result);
556     }
557 if ($total>0)
558 {?>
559 <table align="center">
560   <tr class="lista_titlu">
561     <td align="center">Nr.</td>
562       <td>Numar</td>
563       <td>Data</td>
564       <td>Nr. pui</td>
565       <td>Gr. pui</td>
566       <td>Nr. pui morti</td>
567       <td>Gr. pui morti</td>
568       <td>Ferma</td>
569       <td>Documente</td>
570       <td>Creat</td>
571       <td>Comenzi</td>
572     </tr>
573   <?php $index=1;
574   do { ?>
575   <tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_par";?>">
576     <td align="center"><?php echo $index; ?> </td>
577         <td><?php echo $row['Numar'];?> </td>
578         <td><?php echo date("d/m/Y", strtotime($row['Data']));?> </td>
579         <td><?php echo  $row['Pui'];?> </td>
580         <td><?php echo  $row['Greutate'];?> </td>
```

Ln 318, Col 26 Tab Size: 4 UTF-8 CRLF PHP

HTML

E:\Documents\Pagini Web\Safir dep\lista_lot.php - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Win

logfile.php | lista_lot.php

```
539 <?php }?>
540
541 <div id="maincontent"><!-- InstanceBeginEditable name="Conti
542 <p><span class="title">Adauga</span><br/>
543   <a href="control_lot.php?id=0">Lot nou</a></p>
544 <p class="title">Loturi active</p>
545 <?php
546 $query = "SELECT l.*, c.`nume_user` AS `user_creat`
547         FROM `lot` AS l
548         LEFT JOIN `users` AS c ON (l.`User`=c.`id_user`)
549         WHERE l.`Activ` <> 0 ORDER BY l.`ID_LOT` DESC";
550 $result = mysql_query($query);
551 $total=0;
552 if ($result && (mysql_num_rows($result) > 0))
553     {
554     $total=mysql_num_rows($result);
555     $row = mysql_fetch_assoc($result);
556     }
557 if ($total>0)
558 {?>
559 <table align="center">
560   <tr class="lista_titlu">
561     <td align="center">Nr.</td>
562       <td>Numar</td>
563       <td>Data</td>
564       <td>Nr. pui</td>
565       <td>Gr. pui</td>
566       <td>Nr. pui morti</td>
567       <td>Gr. pui morti</td>
568       <td>Ferma</td>
569       <td>Documente</td>
570       <td>Creat</td>
571       <td>Comenzi</td>
572     </tr>
573   <?php $index=1;
574   do { ?>
575   <tr class="<?php if ($index%2) echo "lista_in
576     <td align="center"><?php echo $index; ?> </td>
577       <td><?php echo $row['Numar']; ?> </td>
578       <td><?php echo date("d/m/Y", strtotime($row['Data']))
579       <td><?php echo  $row['Pui']; ?> </td>
580       <td><?php echo  $row['Greutate']; ?> </td>
581       <td><?php echo  $row['Pui_Morti']; ?> </td>
582       <td><?php echo  $row['Greutate_Morti']; ?> </td>
583       <td><?php echo  $row['Ferma']; ?> </td>
584       <td><?php echo  $row['Documente']; ?> </td>
```

```
<table align="center">
  <tr class="lista_titlu">
    <td align="center">Nr.</td>
      <td>Numar</td>
      <td>Data</td>
      <td>Nr. pui</td>
      <td>Gr. pui</td>
```

HTML + PHP

E:\Documents\Pagini Web\Safir dep\lista_lot.php - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

logfile.php | lista_lot.php

```
539 <?php }?>
540
541 <div id="maincontent"><!-- InstanceBeginEditable name="Continut" -->
542 <p><span class="title">Adauga</span><br/>
543   <a href="control_lot.php?id=0">Lot nou</a></p>
544 <p class="title">Loturi active</p>
545 <?php
546 $query = "SELECT l.*, c.`nume_user` AS `user_creat`
547         FROM `lot` AS l
548         LEFT JOIN `users` AS c ON (l.`User`=c.`id_user`)
549         WHERE l.`Activ` <> 0 ORDER BY l.`ID_LOT` DESC";
550 $result = mysql_query($query);
551 $total=0;
552 if ($result && (mysql_num_rows($result) > 0))
553     {
554     $total=mysql_num_rows($result);
555     $row = mysql_fetch_assoc($result);
556     }
557 if ($total>0)
558 {?>
559 <table align="center">
560   <tr class="lista_titlu">
561     <td align="center">Nr.</td>
562       <td>Numar</td>
563       <td>Data</td>
564       <td>Nr. pui</td>
565       <td>Gr. pui</td>
566       <td>Nr. pui morti</td>
567       <td>Gr. pui morti</td>
568       <td>Ferma</td>
569       <td>Documente</td>
570       <td>Creat</td>
571       <td>Comenzi</td>
572     </tr>
573   <?php $index=1;
574   do { ?>
575   <tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_par";
576     <td align="center"><?php echo $index; ?> </td>
577       <td><?php echo $row['Numar'];?> </td>
578       <td><?php echo date("d/m/Y", strtotime($row['Data']));?> </td>
579       <td><?php echo  $row['Pui'];?> </td>
580       <td><?php echo  $row['Greutate'];?> </td>
581       <td><?php echo  $row['Pui_Morti'];?> </td>
582       <td><?php echo  $row['Greutate_Morti'];?> </td>
583       <td><?php echo  $row['Ferma'];?> </td>
584       <td><?php echo  $row['Documente'];?> </td>
```

```
<tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_p
  <td align="center"><?php echo $index; ?> </td>
      <td><?php echo $row['Numar'];?> </td>
      <td><?php echo date("d/m/Y", strtotime($row['Data']));?> <
      <td><?php echo  $row['Pui'];?> </td>
      <td><?php echo  $row['Greutate'];?> </td>
```

HTML + PHP + SQL

E:\Documents\Pagini Web\Safir dep\lista_lot.php - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

logfile.php | lista_lot.php

```
539 <?php }?>
540
541 <div id="maincontent">
542 <p><span class="title">Adauga</span><br/>
543   <a href="control_lot.php?id=0">Lot nou</a></p>
544 <p class="title">Loturi active</p>
545 <?php
546 $query = "SELECT l.*, c.`nume_user` AS `user_creat`
547         FROM `lot` AS l
548         LEFT JOIN `users` AS c ON (l.`User`=c.`id_user`)
549         WHERE l.`Activ` <> 0 ORDER BY l.`ID_LOT` DESC";
550 $result = mysql_query($query);
551 $total=0;
552 if ($result && (mysql_num_rows($result) > 0))
553     {
554     $total=mysql_num_rows($result);
555     $row = mysql_fetch_assoc($result);
556     }
557 if ($total>0)
558 {?>
559 <table align="center">
560   <tr class="lista_titlu">
561     <td align="center">Nr.</td>
562       <td>Numar</td>
563       <td>Data</td>
564       <td>Nr. pui</td>
565       <td>Gr. pui</td>
566       <td>Nr. pui morti</td>
567       <td>Gr. pui morti</td>
568       <td>Ferma</td>
569       <td>Documente</td>
570       <td>Creat</td>
571       <td>Comenzi</td>
572     </tr>
573   <?php $index=1;
574   do { ?>
575   <tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_par";?>">
576     <td align="center">
577       <td><?php echo $row['Numar'];?> </td>
578       <td><?php echo date("d/m/Y", strtotime($row['Data']));?> </td>
579       <td><?php echo  $row['Pui'];?> </td>
580       <td><?php echo  $row['Greutate'];?> </td>
581       <td><?php echo  $row['Pui_Morti'];?> </td>
582       <td><?php echo  $row['Greutate_Morti'];?> </td>
583       <td><?php echo  $row['Ferma'];?> </td>
584       <td><?php echo  $row['Documente'];?> </td>
```

```
<?php
$query = "SELECT l.*, c.`nume_user` AS `user_creat`
        FROM `lot` AS l
        LEFT JOIN `users` AS c ON (l.`User`=c.`id_user`)
        WHERE l.`Activ` <> 0 ORDER BY l.`ID_LOT` DESC";
$result = mysql_query($query);
$total=0;
if ($result && (mysql_num_rows($result) > 0))
    {
    $total=mysql_num_rows($result);
    $row = mysql_fetch_assoc($result);
    }
```

HTML

- Offers **the logical structure** of the document
- Required
  - the **final result** of any type of programming for a distributed application web is almost exclusively HTML code (HTML structure eventually manipulated by "client side scripting"/Javascript)
- Curs 1 PAW 2021-2022 – Recapitulare HTML (RO + video)
- Course: Web Technologies (2012-2013) (EN)
  - http://rf-opto.etti.tuiasi.ro/internet.php
  - Web Technologies, Lecture 5
  - Web Technologies, Lecture 6

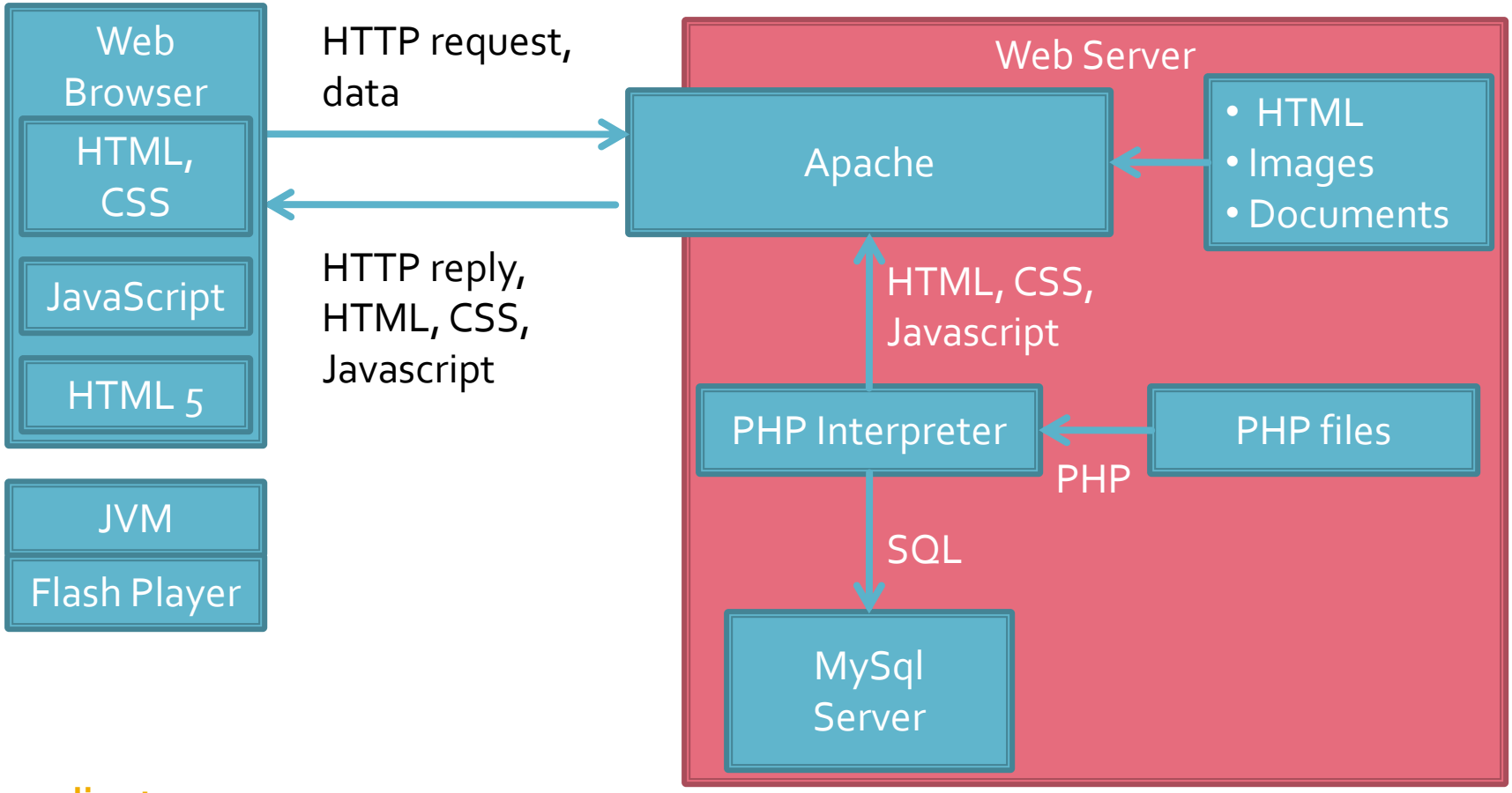
Hypertext PreProcessor

PHP

PHP

- Hypertext PreProcessor – recursive acronym
  - initial – Personal Home Page / Form Interpreter
  - 1995 – 1.0
- current version: 7.4.33
  - 2022-11-03
- current version: 8.3.0
  - 2023-08-03
- general-purpose scripting language
- server-side scripting
- open source

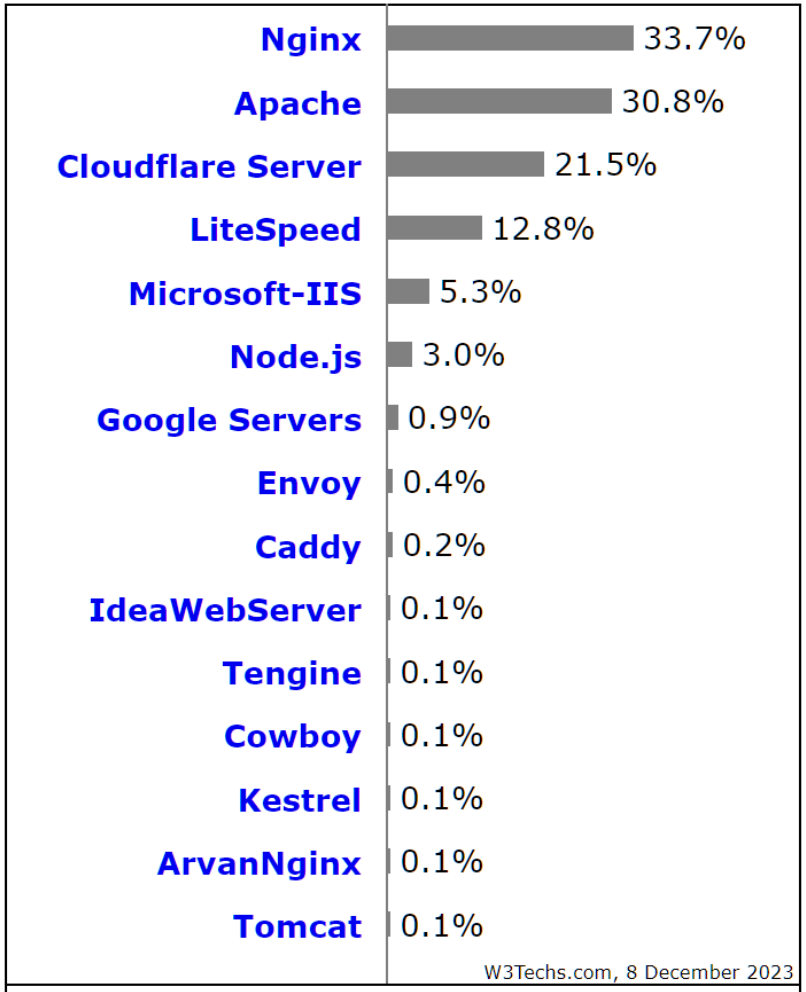
Client/Server Scripting



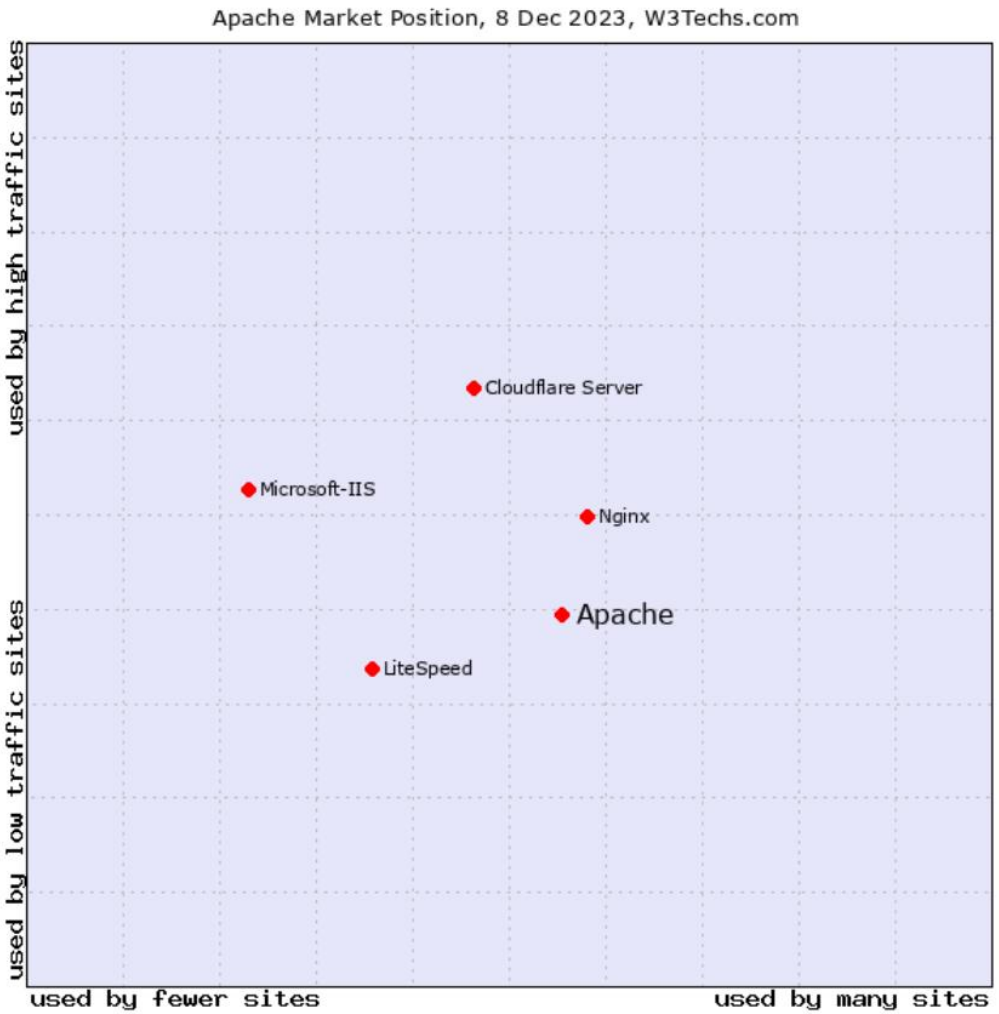
client side scripting

server side scripting

Technology of Web servers

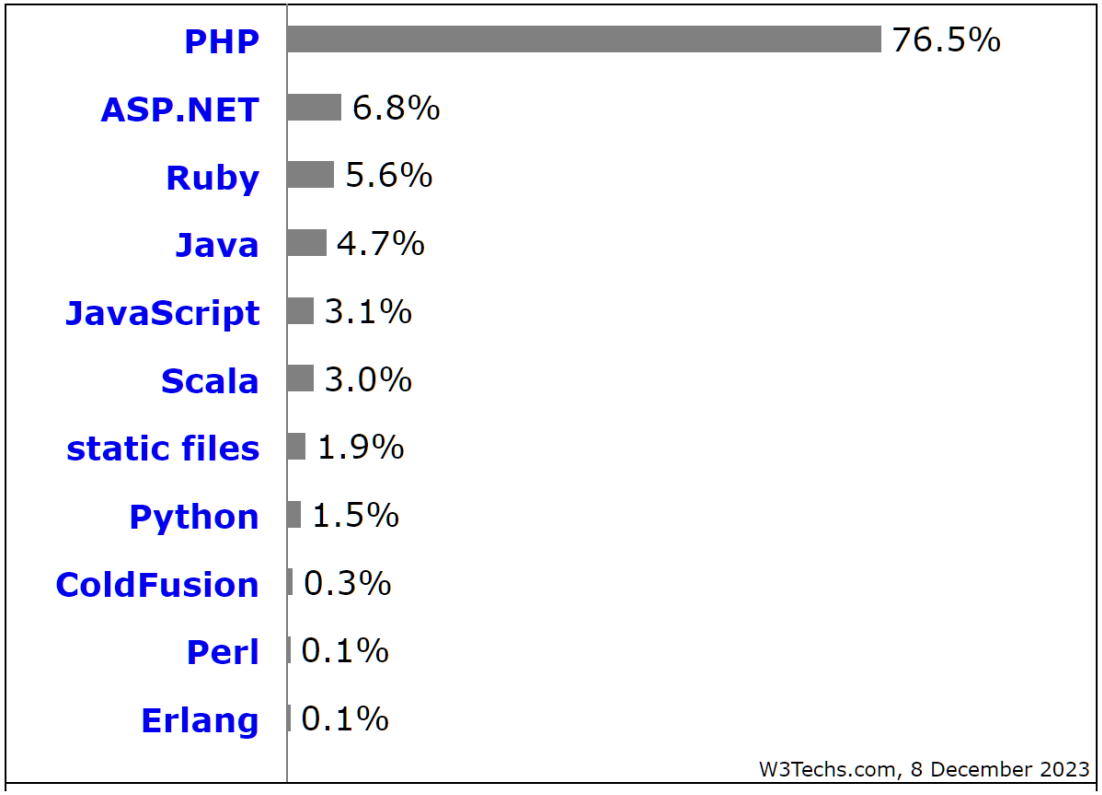


Percentages of websites using various web servers
Note: a website may use more than one web server



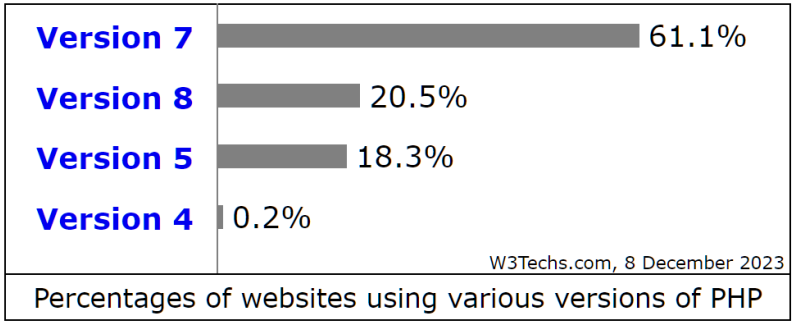
Technology of Web servers

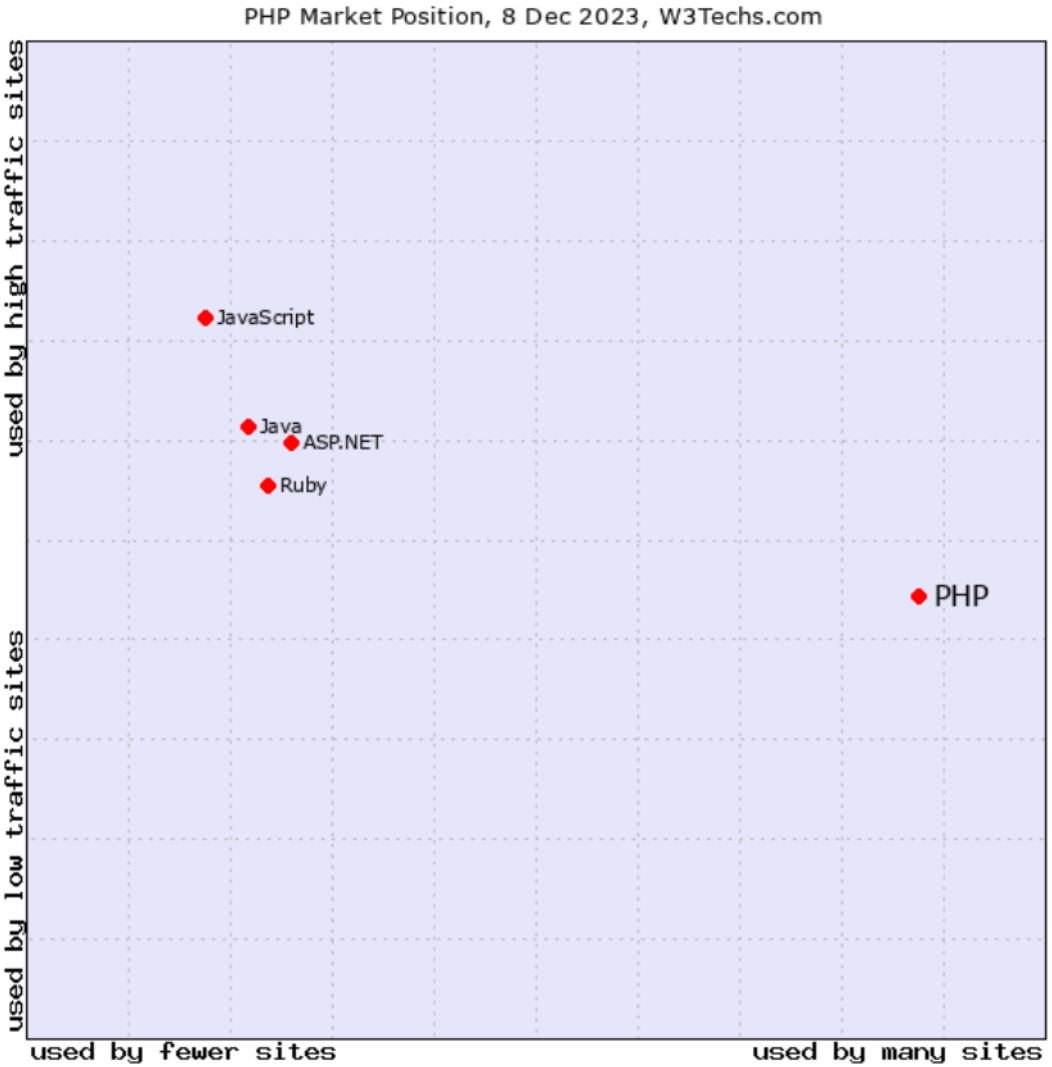
- PHP – 76.5%
- ASP.NET – 6.8%
- Ruby – 5.6%
- Java – 4.7%
- JavaScript – 3.1%
- Scala – 3.0%
- …
- Python – 1.3%



Technology of Web servers

- PHP version

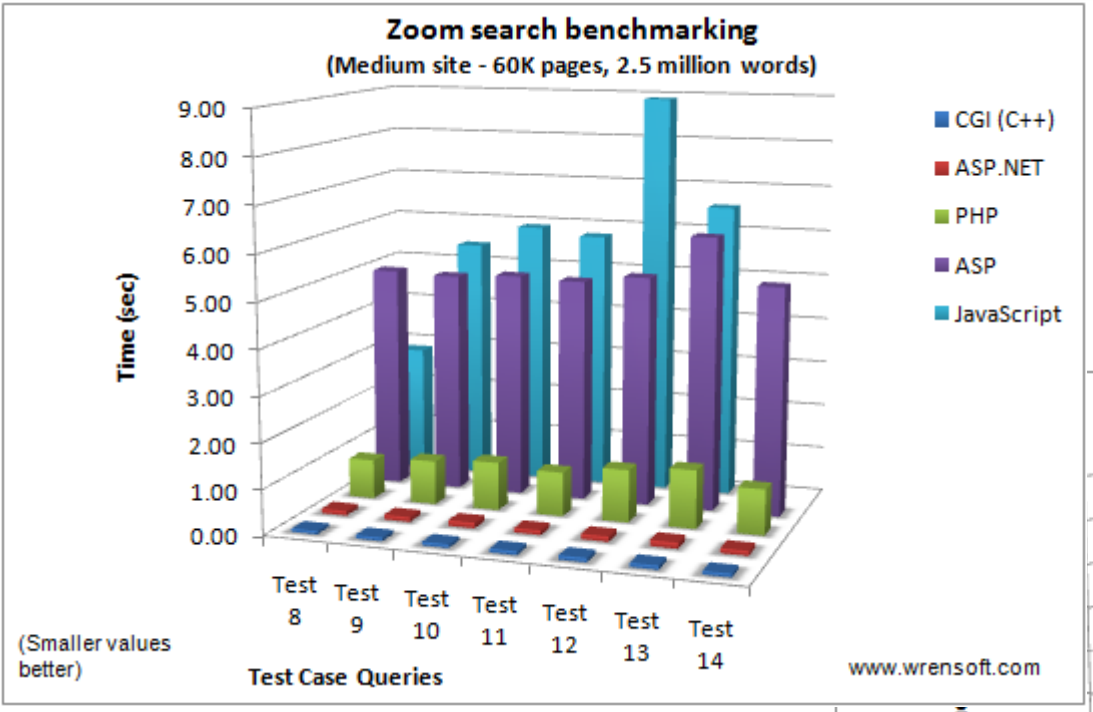


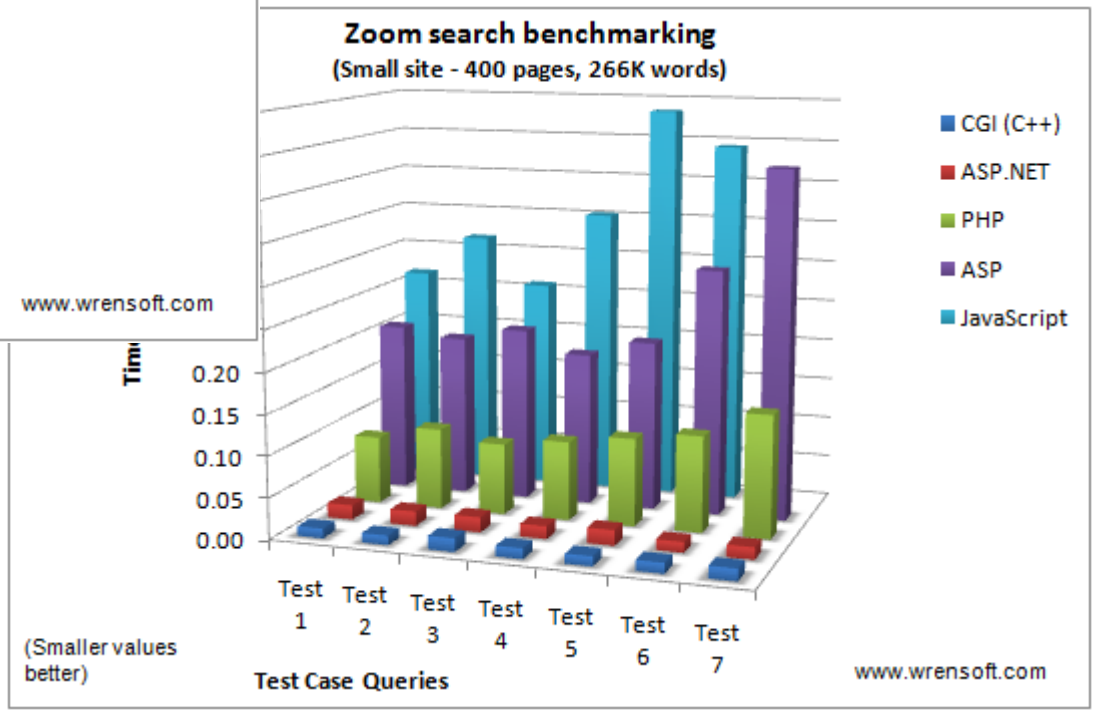


PHP Advantages

- Efficient performance (but interpreted language!)
- Strong support for database integration
- Low cost (Open source)
- Extensive library (dedicated for web)
- Easy to learn and use (C)
- Portability and compatibility
  - Open source: source available
- **Large and active community**
- Commercial support widely available

Performance





Sites

- Facebook.com
- Wikipedia.org
- Whatsapp.com
- Sina.com.cn
- Pinterest.com
- Vk.com
- Zoom.us
- Wordpress.com
- Tumblr.com
- Digicert.com

PHP - Concepts

- interpreted language – compiled "on the fly" by a PHP interpreter on the server
- PHP scripts contain the sources
  - there is the possibility of pre-compiling the sources in order to increase speed
  - Hip-Hop for PHP / Facebook
  - HipHop Virtual Machine / Facebook
- oriented towards dynamic web applications (libraries)
- can be integrated into HTML - typical usage

Integration

```
556         }
557     if ($total>0)
558     {?>
559     <table align="center">
560       <tr class="lista_titlu">
561         <td align="center">Nr.</td>
562           <td>Numar</td>
563           <td>Data</td>
564           <td>Nr. pui</td>
565           <td>Gr. pui</td>
566           <td>Nr. pui morti</td>
567           <td>Gr. pui morti</td>
568           <td>Ferma</td>
569           <td>Documente</td>
570           <td>Creat</td>
571           <td>Comenzi</td>
572         </tr>
573       <?php $index=1;
574       do { ?>
575       <tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_par";?>">
576         <td align="center"><?php echo $index; ?> </td>
577             <td><?php echo $row['Numar'];?> </td>
578             <td><?php echo date("d/m/Y", strtotime($row['Data']));?> </td>
579             <td><?php echo  $row['Pui'];?> </td>
580             <td><?php echo  $row['Greutate'];?> </td>
```

⊗ 12 ⚠ 0 (A) 0

Escaping from HTML

- A PHP file normally contains HTML tags (**IS** basically a HTML file), with some PHP code **sections** inside
- PHP interpreter
- the PHP interpreter looks for sections that it needs to interpret and their interior is processed as PHP code
- what is found **outside** these sections is sent to the web server **unmodified**
- most of the time the result is a virtual "text file" containing (pure) **HTML** code (+CSS/Javascript)

Escaping from HTML

- **<?php … ?>**
  - XML type – default, always available, recommended
- <? … ?>
  - short, usually deactivated
  - absent in PHP 7,8
- <script language="php"> … </script>
  - script type, available
- <% … %>
  - ASP type, usually deactivated
  - absent in PHP 7,8

Escaping from HTML

- **echo** …. a PHP language construct: output one or more strings (equivalent with puts() in C)
- can process data
  - echo $a + $b;
- in most cases "output" is the data sent to the client by the web server
- "output" can usually be considered:
  - the current document
  - that particular script position inside the document

HTML + PHP

E:\Documents\Pagini Web\Safir dep\lista_lot.php - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

logfile.php | lista_lot.php

```
539 <?php }?>
540
541 <div id="maincontent"><!-- InstanceBeginEditable name="Continut" -->
542 <p><span class="title">Adauga</span><br/>
543   <a href="control_lot.php?id=0">Lot nou</a></p>
544 <p class="title">Loturi active</p>
545 <?php
546 $query = "SELECT l.*, c.`nume_user` AS `user_creat`
547         FROM `lot` AS l
548         LEFT JOIN `users` AS c ON (l.`User`=c.`id_user`)
549         WHERE l.`Activ` <> 0 ORDER BY l.`ID_LOT` DESC";
550 $result = mysql_query($query);
551 $total=0;
552 if ($result && (mysql_num_rows($result) > 0))
553     {
554     $total=mysql_num_rows($result);
555     $row = mysql_fetch_assoc($result);
556     }
557 if ($total>0)
558 {?>
559 <table align="center">
560   <tr class="lista_titlu">
561     <td align="center">Nr.</td>
562       <td>Numar</td>
563       <td>Data</td>
564       <td>Nr. pui</td>
565       <td>Gr. pui</td>
566       <td>Nr. pui morti</td>
567       <td>Gr. pui morti</td>
568       <td>Ferma</td>
569       <td>Documente</td>
570       <td>Creat</td>
571       <td>Comenzi</td>
572     </tr>
573   <?php $index=1;
574   do { ?>
575   <tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_par";
576     <td align="center"><?php echo $index; ?> </td>
577       <td><?php echo $row['Numar'];?> </td>
578       <td><?php echo date("d/m/Y", strtotime($row['Data']));?> </td>
579       <td><?php echo  $row['Pui'];?> </td>
580       <td><?php echo  $row['Greutate'];?> </td>
581       <td><?php echo  $row['Pui_Morti'];?> </td>
582       <td><?php echo  $row['Greutate_Morti'];?> </td>
583       <td><?php echo  $row['Ferma'];?> </td>
584       <td><?php echo  $row['Documente'];?> </td>
```

```
<tr class="<?php if ($index%2) echo "lista_impar"; else echo "lista_p
  <td align="center"><?php echo $index; ?> </td>
      <td><?php echo $row['Numar'];?> </td>
      <td><?php echo date("d/m/Y", strtotime($row['Data']));?> <
      <td><?php echo  $row['Pui'];?> </td>
      <td><?php echo  $row['Greutate'];?> </td>
```

Escaping possibilities

- All versions offer the same HTML source for the browser
- The one that leaves the HTML structure outside the escaping tags and only the dynamic data results from PHP processing is **recommended**
- HTML + PHP code is interpreted much more elegantly in WYSIWYG editors

```
<h2>Transaction result</h2>
<?php echo '<p>Command received</p>';?>
```

```
<h2>Transaction result</h2>
<p><?php echo 'Command received';?></p>
```

```
<?php echo '<h1>Online Shop XXX SRL</h1>';?>
<?php echo '<h2>Transaction result</h2>';?>
<?php echo '<p>Command received</p>';?>
```

```
<?php
echo '<h1>Online Shop XXX SRL</h1>';
echo '<h2>Transaction result</h2>';
echo '<p>Command received</p>';
?>
```

Escaping possibilities

test.php

```
1  <h2>Rezultate comanda</h2>
2  <p><?php echo 'Comanda receptionata';?></p>
3
4  <?php
5  echo '<h1>Magazin online XXX SRL</h1>';
6  echo '<h2>Rezultate comanda</h2>';
7  echo '<p>Comanda receptionata</p>';
8  ?>
9
```

PHP – statements

- PHP statements end with a semicolon **;**
  - exception: semicolon can be omitted at the end of the PHP code block: **… echo 'something' ?>**
- multiple statements can be written on the same line (without moving to the next line)
  - **echo 'some1'; echo 'some2'; …**
  - not recommended

PHP – comments

- comments in PHP follow C and Pearl syntax
- at the end of the line:
  - // echo some; //comment
  - # echo some; #comment
- block comment
  - /* … */
  - /* a
    multiline
    comment */

PHP – constants

- Like any programming language PHP is based on usage
  - constants
  - variables
  - functions
- Constants definition:
  - define('BOOKPRICE', 100);
- "case sensitive"
  - by convention, only in capital letters
  - echo BOOKPRICE; // 100

PHP – variables

- variable – **$** character followed by the variable name
- the variable name is "case sensitive"
- a frequent mistake is forgetting the $ char
  - PHP Notice: Use of undefined constant an – assumed $an (or 'an') in D:\\Server\\
- Data types
  - scalar
  - composite
  - special

PHP – data types

- scalar
  - Boolean
  - integer
  - float (double)
  - **string**
- composite
  - array
  - object
- special
  - resource
  - NULL

PHP – Variables

- declaring variables is **not required**, except when declaring a definition domain (eg. global variables)
  - global $a, $b;
    $c=$a+$b;
- freeing the memory is not necessary, PHP does it automatically at the end of the script

PHP – Variables

$var = **expression**

- Control of variables is automatic, "on the fly"
  - A variable starts with the **$** sign, followed by the name of the variable
  - PHP has no command for declaring a variable. It is created the moment you first assign a value to it
  - PHP automatically associates a data type to the variable, depending on its value
  - Variable names are case-sensitive ($age and $AGE are two different variables)

PHP – data types

- PHP automatically associates a data type to the variable, depending on its value
- automatic conversions are often **not** numerical but "**human**"
- In PHP 7, type declarations were added for function arguments, return values and class properties

```
<?php
echo $variable ;  //  type Null, not initialized – value NULL (only)
$variable  = "0";  // $ variable   type  string (ASCII 48)
$variable  += 2;   // $ variable   type  integer (2)
$variable  = $ variable  + 1.3;  // $variable   type  float (3.3)
$variable  = 5 + "10 objects"; // $variable   type  integer (15)
$var2=5; // $var2   type  integer (5)
$variable =$var2."10 objects";    //  $variable   type  string  "510 objects"
?>
```

PHP – operators

- Similar (generally) to C/C++
- An operator takes one or more values (or expressions), performs an operation and yields another value
- Operators are divided in three groups
  - Unary operators: applied to one value
  - Binary operators: applied to two values
  - Ternary operators: applied to three values

PHP – operators

- Operators
  - Arithmetic
  - Assignment
  - Bitwise
  - Comparison
  - Incrementing/Decrementing
  - Logical
  - **String**

PHP – operators

- Arithmetic
  - -$a – Negation
  - $a + $b – Addition
  - $a - $b – Subtraction
  - $a * $b – Multiplication
  - $a / $b – Division
  - $a % $b – Modulo (remainder)
  - $a ** $b – Exponentiation
- **String**
  - **$a.$b – Concatenation String a with String b**

PHP – operators

- Assignment
  - $a=$b
  - $a+=$b (a=a+b)
  - $a-=$b (a=a-b)
  - $a/=$b (a=a/b)
  - $a*=$b (a=a*b)
  - $a%=$b (a=a%b)
  - $a**=$b ($a=a^b$)
  - **$a.=$b (a=a concatenate b - strings)**

PHP – operators

- Bitwise operators
  - similar to C
  - ~ , & , | , ^ , << , >>
- Logical operators
  - offer a boolean result (always: true/false)
  - Some similar to C
    - && , || , !
  - Supplemental
    - and , or , xor – equivalent but with lower priority
    - $a=55/0 or die('divide by 0');

PHP – operators

- Comparison operators
  - most of the time offer a boolean result (true/false)
  - similar to C
  - == , != , > , < , <> , >= , <=
  - Supplemental
    - === "Identical", equal value **AND** same type
    - !== "Not identical", different value **OR** different type
    - <=> "Spaceship", an integer -1/0/1 depending on relation between operands
    - ?: "Ternary", (expr1) ? (expr2) : (expr3) evaluates to expr2 if expr1 evaluates to true, and expr3 if expr1 evaluates to false
    - ?? "Null Coalescing", $var = expression ?? 'default value if NULL';

Operator Precedence

non-associative	clone new	clone and new
left	[	array()
non-associative	++ --	increment/decrement
right	~ - (int) (float) (string) (array) (object) (bool) @	types
non-associative	instanceof	types
right	!	logical
left	* / %	arithmetic
left	+ - .	arithmetic and string
left	<< >>	bitwise
non-associative	< <= > >= <>	comparison
non-associative	== != === !==	comparison
left	&	bitwise and references
left	^	bitwise
left	|	bitwise
left	&&	logical
left	||	logical
left	? :	ternary
right	= += -= *= /= .= %= &= |= ^= <<= >>=	assignment
left	and	logical
left	xor	logical
left	or	logical
left	,	many uses

Operator Precedence PHP8

non-associative	clone new	clone and new
left	[	array()
non-associative	++ --	increment/decrement
right	~ - (int) (float) (string) (array) (object) (bool) @	types
non-associative	instanceof	types
right	!	logical
left	* / %	arithmetic
left	+ - .	arithmetic and string
left	<< >>	bitwise
non-associative	< <= > >= <>	comparison
non-associative	== != === !== <=>	comparison
left	&	bitwise and references
left	^	bitwise
left	|	bitwise
left	&&	logical
left	||	logical
right	??	comparison
left	? :	ternary
right	= += -= *= /= .= %= &= |= ^= <<= >>=	assignment
left	and	logical
left	xor	logical
left	or	logical
left	,	many uses

PHP – Functions

- conceptual similar to C/C++
- functions must not be declared before being used
- name of the functions is "case-insensitive"
- an extremely large number of functions useful in web applications exist in standard PHP libraries
- some libraries must be activated in php.ini
  - extension=php_gd2.dll // graphical processing functions
  - extension=php_mysqli.dll // MySql access functions

Usage of PHP functions

- <form action="result.php" method="post">

```
<p>Order received at date:
<?php echo date('d/m/Y')." time ".date('H:i');?></p>
```

Magazin online XXX SRL

Rezultate comanda

Comanda receptionata la data: 10/03/2010 ora 13:36

```
<body>
<h1>Shop online XXX SRL</h1>
<h2>Order result</h2>
<p>Order received at date:
10/03/2010 time 13:36</p>
</body>
```

Control Structures

- most notions and syntax similar to C/C++
- statement-group: encapsulate a group of statements with curly braces {…}
- if / else / elseif – conditional execution

```
<?php
if ($a > $b) {
   echo "a mai mare ca b";
} elseif ($a == $b) {
   echo "a egal cu b";
} else {
   echo "a  mai mic ca  b";
}
?>
```

Control Structures

- while
- do-while
- for
- switch
- return
- break
- goto

- similar to C/C++ equivalents

```
$i = 1;
while ($i <= 10) {
   echo $i++;
}
```

```
$i = 10;
do {
   echo $i--;
} while ($i > 0);
```

```
for ($i = 1; $i <= 10; $i++) {
   echo $i;
}
```

```
switch ($i) {
   case 0:
      echo "i este 0";
      break;
   case 1:
      echo "i  este  1";
      break;
   default:
      echo "i nici 1 nici 0";
      break;
}
```

Control Structures

- include()
- require()
- include_once()
- require_once()

- includes **and** evaluates the specified file
- used to avoid multiple evaluations of common code sections
- require will halt the script if the specified file is not found
- …_once() checks if the code from a file has already been included and it will **not** be included **again**

String Variables

PHP – data types

- scalar
  - Boolean
  - integer
  - float (double)
  - **string**
- composite
  - array
  - object
- special
  - resource
  - NULL

String Variables

- The ultimate goal of PHP is to populate the existing fields in an HTML skeleton with data (in the form of **text**)
- As a result, string data is treated more complex than the C/C++ counterpart
  - more ways of defining strings
  - more ways of interpreting strings
  - **much** more string related functions

String Variables

- string definition
  - single quoted: apostrophe ‘ ’
  - double quoted: quotation marks “ ”
  - block definition
    - heredoc <<< X … X;
    - nowdoc <<<‘X’ … X;(PHP>5.3.0)

String Variables ' '

- single quotes ' ' are used for the definition of classic basic strings
  - a set of characters is defined
  - processing inside the string is reduced
    - \' is a literal single quote
    - \\ and \ are a literal backslash
    - **only!!!**

String Variables " "

- double-quotes " " are used for the definition of complex strings
  - complex processing inside the string more than the C/C++ equivalent
    - special ASCII characters, similar to C++: \n, \r, \t, \\, \v, \e, \f, \x, \u
    - \" character double-quote
    - \$ character $
    - **variable names** inside the string will be expanded !!!

String Variables " "

- unescaped character dollar sign $ means a variable name will follow
  - the parser will take as many tokens as possible to form a valid variable name ($x, $x->y, $x[y])
  - if more complex variables are required (2 indexes array x[y][z] or non-integer indexes) enclose the variable name in curly braces { } to explicitly specify the end of the name

String Variables " "

- **simple** syntax for variable parsing

```
<?php
$juice = "apple";

echo "He drank some $juice juice.";
//  He drank some apple juice.
echo "He drank some juice made of $juices.";
//  He drank some juice made of .  //s caracter valid pentru variabile

?>
```

String Variables " "

- **simple** syntax for variable parsing

```
<?php
 $juices = array("apple", "orange", "koolaid1" => "purple");
 class people {
   public $john = "John Smith";
}

$people = new people();
echo "$people->john drank some $juices[0] juice.";
// John Smith drank some apple juice.
?>
```

String Variables " "

- **complex** syntax for variable parsing { }

```
<?php
$juice = "apple";

echo "He drank some juice made of $juices.";
//  He drank some juice made of .  //s caracter valid pentru variabile
echo "He drank some juice made of ${juice}s."
//  He drank some juice made of apples.  // {} arata unde se incheie
numele variabilei
?>
```

String Variables " "

- **complex** syntax for variable parsing { }

```
<?php
 $juices = array(array("apple", "orange"), "koolaid1" => "purple");
 class people {
   public $name = "John Smith";
}

$obj->values[3] = new people();
echo "$obj->values[3]->name drank some $juices[0][1] juice.";
 //  drank some  juice.
echo "{$obj->values[3]->name} drank some {$juices[0][1]} juice.";
// John Smith drank some apple juice.
?>
```

Heredoc syntax

```
<?php
// no indentation
echo <<<END
        a
       b
      c
\n
END;

// 4 spaces of indentation
echo <<<END
       a
      b
    c
    END;
?>
```

Nowdoc syntax

- "Nowdocs are to single-quoted strings what heredocs are to double-quoted strings"
- **Multiline** string with minimal (**no**) processing

```
<?php
echo <<<'EOD'
Example of string spanning multiple lines
using nowdoc syntax. Backslashes are always treated
literally,
e.g. \\ and \'.
EOD;
?>
```

Documentation

- https://www.php.net/
- http://rf-opto.etti.tuiasi.ro/master_it.php

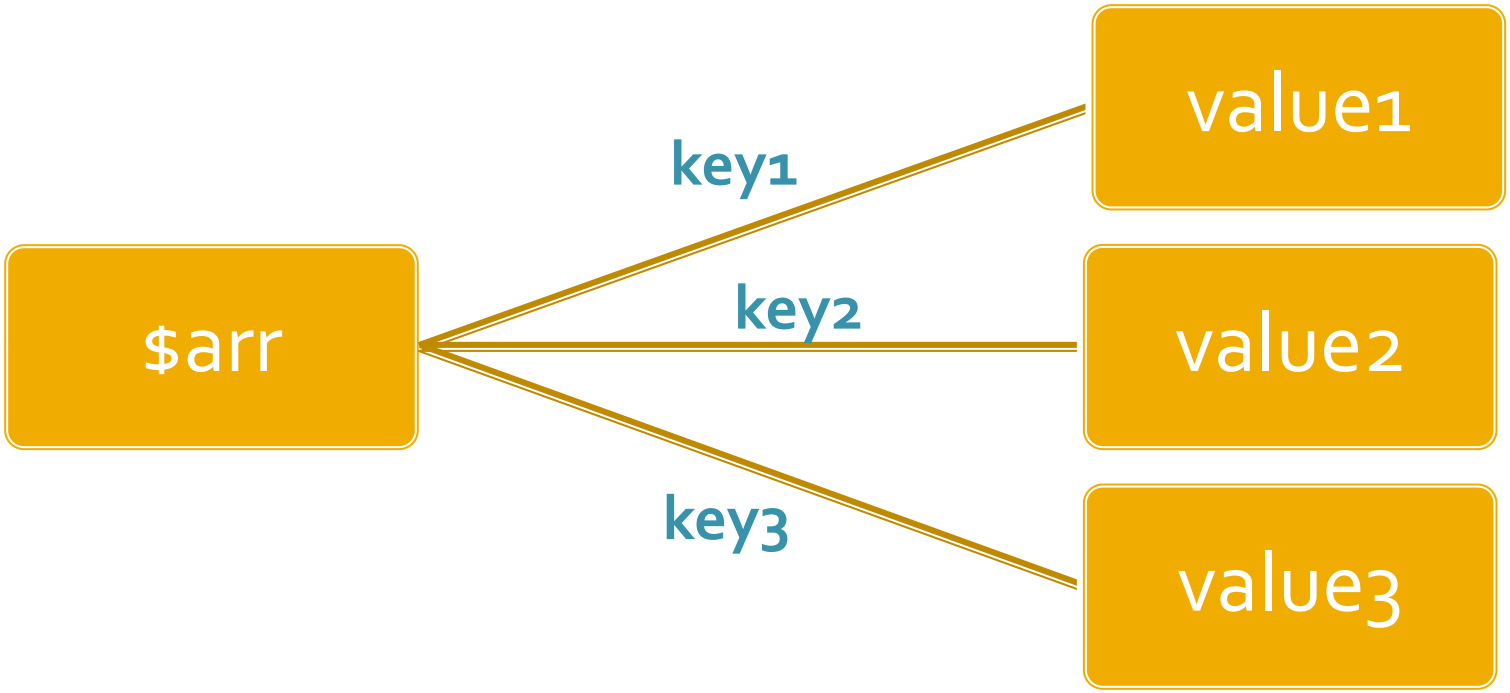
Arrays

Arrays in PHP

- An array in PHP is actually an ordered map. A map is a type that associates **values** to **keys**
- unlike C, Basic, **keys** are **not** required to be **integers**, can be **strings**
- default keys (if not otherwise specified) are consecutive integers with first key 0 (C syntax).
- defining a key / value pair
  - key **=>** value
- create an array
  - $arr = **array**("definition of key / value pairs")
  - pairs: key **=>** value, key **=>** value, ...

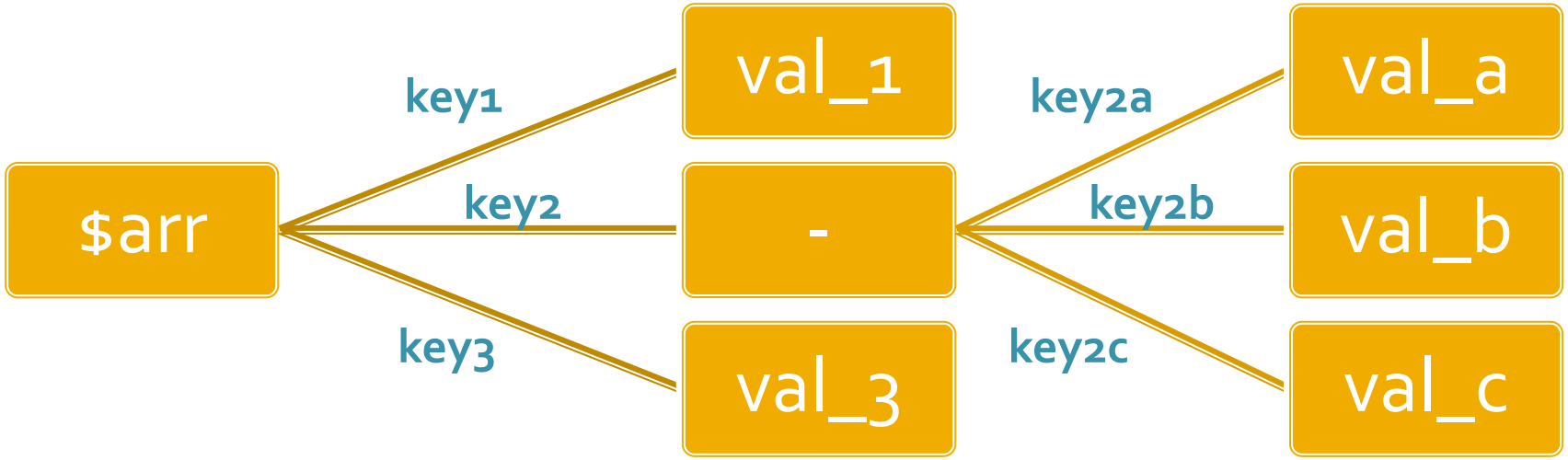
Array = Logical tree

- $arr = array(key1 => value1, key2 => value2, key3 => value3)



Array = Logical tree

- In particular, one or more of the values can in turn be an array, leading to **branching** of the tree
- $arr = array(key1 => val_1, **key2 => array**(key2a => val_a, key2b => val_b, key2c => val_c), key3 => val_3)



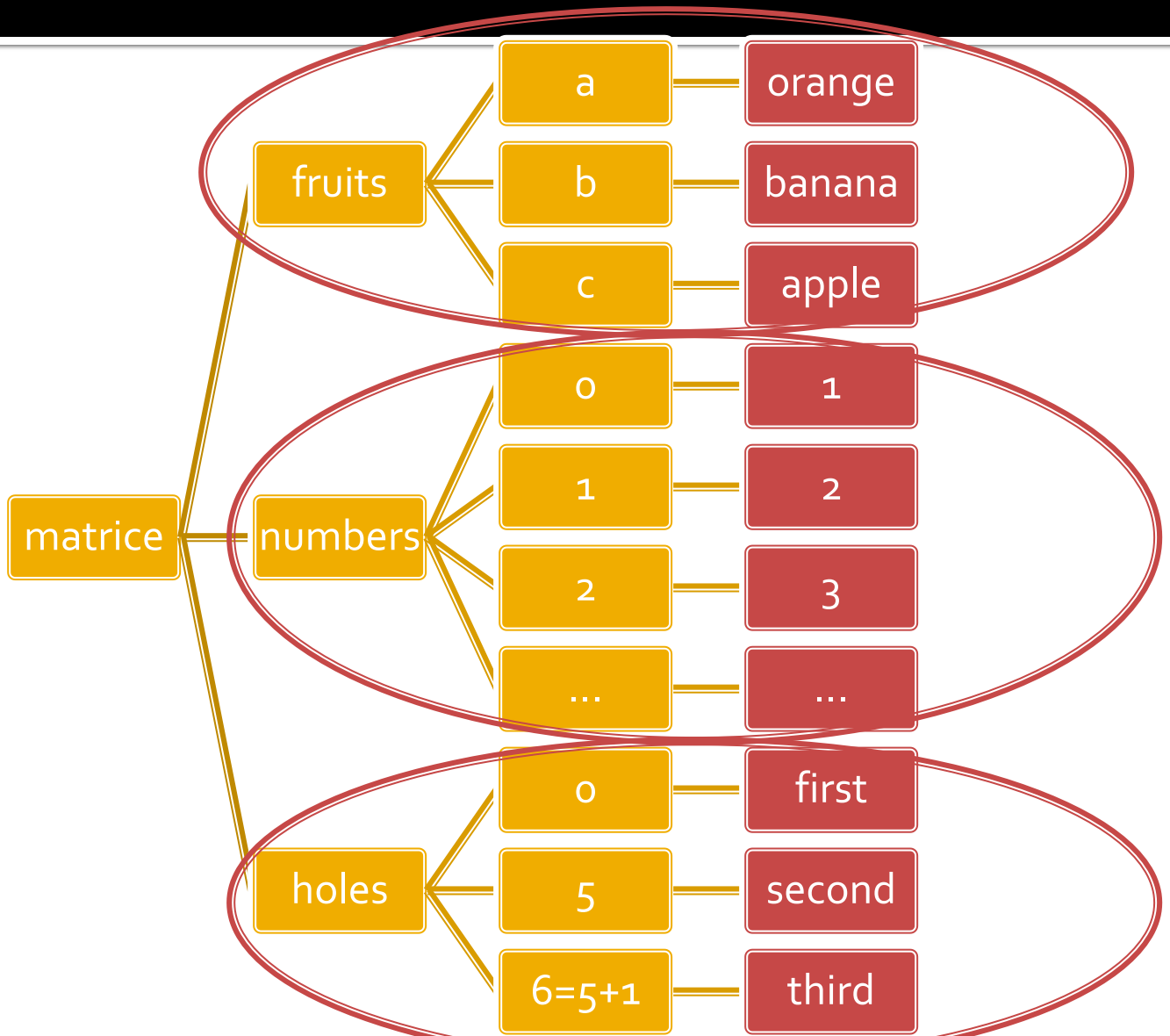
Arrays in PHP

```
$matr = array(1, 2, 3, 4, 5);

$matr[0]=1
$matr[1]=2
$matr[2]=3
$matr[3]=4
$matr[4]=5
```

```
$matr = array('a' => 1, 'b'  => 2, 3, 4, 5);

$matr['a']=1
$matr['b']=2
$matr[0]=3
$matr[1]=4
$matr[2]=5
```

```
$matrice= array (
            "fruits"  => array("a" => "orange", "b" => "banana", "c" => "apple"),
            "numbers" => array(1, 2, 3, 4, 5, 6),
            "holes"   => array("first", 5 => "second", "third")
);
```

Arrays in PHP



View array content (debug)

```
echo "<pre>";
print_r ($matr);
echo "</pre>";
```

```
$matr= array (
"fruits"  =>
array("a" => "orange", "b" => "banana", "c" => "apple" ,
"ultim"),
"numbers" =>
array(1, 2, 3, 4, 5, 6),
"holes"   =>
array("first", 5 => "second", "third" )
);
echo $matr;
echo "<pre>";
print_r ($matr);
echo "</pre>";
```

```
Array

Array
(
    [fruits] => Array
        (
            [a] => orange
            [b] => banana
            [c] => apple
            [0] => ultim
        )

    [numbers] => Array
        (
            [0] => 1
            [1] => 2
            [2] => 3
            [3] => 4
            [4] => 5
            [5] => 6
        )

    [holes] => Array
        (
            [0] => first
            [5] => second
            [6] => third
        )

)
```

Foreach loop

- **foreach (array_expression as $key => $value) statement**
- **foreach (array_expression as $value) statement**
- foreach construct is used to loop through each key/value pair in an array
- On each iteration assign the current element's key to the local variable **$key** and the value of the current element is assigned to the local variable **$value** (scope: statement)
- foreach() works with a **copy** of the array, you cannot change the original array inside the statement
  - foreach ($arr as $key => $value) {
    $value = 'other value'; //**doesn't** work
    $arr[$key] = 'other value'; //works
    }

Example – foreach

```
$matr = array (
  "fruits"  => array("a" => "orange", "b" => "banana", "c" => "apple", "ultim"),
  "numbers" => "in loc de numere",
  "holes"   => "in loc de ce era"
);
foreach ($matr as $cheie => $continut)
            echo "matr[".$cheie."]=".$continut."<br />";
```

```
matr[fruits]=Array
matr[numbers]=in loc de numere
matr[holes]=in loc de ce era
```

PHP Global Variables - Superglobals

PHP Global Variables - Superglobals

- PHP Global Variables - Superglobals (predefined variables)
  - are always accessible, regardless of scope
  - Examples:
    - $_SERVER — Server and execution environment information
    - $_GET — HTTP GET variables
    - $_POST — HTTP POST variables
    - $_FILES — HTTP File Upload variables
    - $_REQUEST — HTTP Request variables
    - $_SESSION — Session variables
    - $_ENV — Environment variables
    - $_COOKIE — HTTP Cookies

Forms in HTML

- required for the user to send data to the server
- <form>…</form>
- Specific attributes:
  - action: address of the script which receives the data
    - <form **action**="<?php echo $_SERVER['PHP_SELF'];?>">
    - <form **action**="actiuni/file2.html">
  - method: method for transmitting data: post or get
    - <form **method**="post" action= … >

Methods

- **post** : data is transmitted as a block (inside the body of the HTTP request)
- **get** : appends form-data into the URL : results.php?prob=81&an=2009
- **get** must be used only for "idempotent" data,
  - no collateral effects
  - no change in server status (databases, etc)
- we can emulate a form (**get**) by writing links appropriately

Form elements

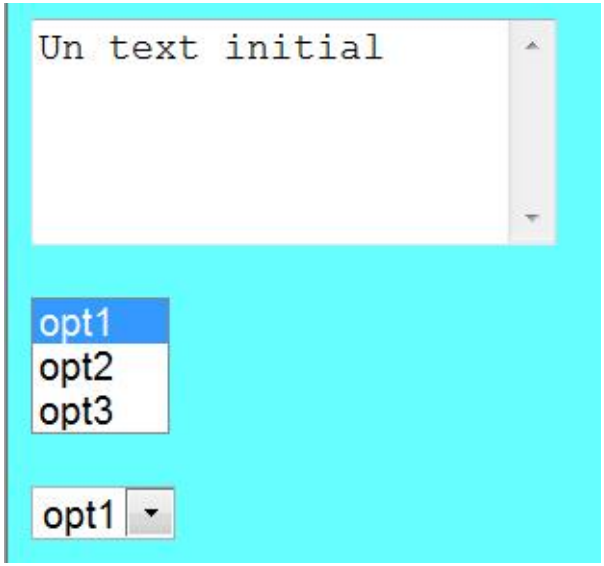
- inside <form>…</form>
  - input
  - select/option
  - textarea
  - button
- **all** elements will have a name
  - attribute: **name**="”
  - the name will be directly present in the URI generated by get, or will be a variable sent by post
- data is effectively sent by a **type="submit"** button

Examples

```
<input name="textfield" type="text" value="ceva" />

<input name="Ok" type="submit" value="Trimite" />

<label><input name="check" type="checkbox" value="5" checked />check1</label>

<label><input name="RG1" type="radio" value="a" checked="checked" />but1</label>
<label><input name="RG1" type="radio" value="b" />but2</label>

<input name="hid" type="hidden" value="6" />
```

TEXTAREA/SELECT

```
<textarea name="textarea" cols="20" rows="5">Un text initial</textarea><br /><br />

<select name="select." size="3">
 <option value="1" selected="selected">opt1</option>
 <option value="2">opt2</option>
 <option value="3">opt3</option>
</select><br /><br />

<select name="select...">
 <option value="1" selected="selected">opt1</option>
 <option value="2">opt2</option>
 <option value="3">opt3</option>
</select>
```



Getting user submitted data

- When a user submits the data by clicking on "Submit", the form data is found in the file specified in the **action** attribute of the <form> tag in one of the superglobal variables:
  - $_POST – method="post"
  - $_GET – method="get"
  - $_REQUEST – both methods
- the superglobal variables are **arrays** with **string keys** controlled by the **name** attribute of the input element
  - <input type="text" name="**books_quant**" size="3" maxlength="3" />
  - $_POST['**books_quant**'] contains the user input in the receiving script

Organizing $_POST

- **name** attributes in the form inputs become **keys** in the superglobal array $_POST
  - <input type="text" name="**books_quant**" size="3" maxlength="3" />
  - $_POST['**books_quant**'] contains the user input
- creating **name** "array like", we can control branching of $_POST grouping input elements in the form as required
  - <input type="text" name="**quant[books]**" size="3" maxlength="3" />
  - $_POST [**'quant'**] [**'books'**] contains the user input

Contact

- Laboratorul de microunde si optoelectronica
- http://rf-opto.etti.tuiasi.ro
- rdamian@etti.tuiasi.ro