Chapter 2: Interactive Web Applications

HTTP Basics

- HTTP = HyperText Transfer Protocol, see http://www.w3.org/Protocols/
- Client-Server communication:
  - Client opens (TCP) connection to server (usually on port 80)
  - Client sends request (as text lines)
  - Server sends response (as text lines)
  - Client closes connection (HTTP is *stateless*)
- Format of all HTTP messages (requests and responses):

```
Initial line
Header lines (zero or more)
Blank line
Message body (optional)
```

- Example HTTP request:

```
GET /lehre/ws1112/mmn/index.html HTTP/1.1
Host: www.medien.ifi.lmu.de:80
<blank line!>
```

Sample HTTP Request (GET)

```
GET /~hussmann/hello.php HTTP/1.1
ACCEPT: text/html,application/xhtml+xml,application/
xml;q=0.9,*/*;q=0.8
ACCEPT_ENCODING: gzip, deflate
ACCEPT_LANGUAGE: en-us
CONNECTION: keep-alive
HOST: localhost
USER_AGENT: Mozilla/5.0 (Macintosh; Intel Mac OS X
10_6_8) AppleWebKit/534.51.22 (KHTML, like Gecko)
Version/5.1.1 Safari/534.51.22
CONTENT_TYPE:
```

HTTP Server Responses

- Message sent back from HTTP server alway contains an initial response line which gives the *status* of the request processing.
- Example (success):

```
HTTP/1.1 200 OK
```

- Example (error):

```
HTTP/1.1 404 Not found
```

- Status codes:
  - 1xx: Informational message
  - 2xx: Success of some kind
  - 3xx: Redirection to other URL
    - e.g. 303: See other URL (given in Location: header)
  - 4xx: Client side error
  - 5xx: Server side error
    - e.g. 500: Server error

Example HTTP Response

- Manually experimenting with HTTP client/server dialogues:
  - "**telnet *<host>* 80**" in UNIX shell
- Retrieving a HTML page:

```
HTTP/1.1 200 OK
Date: Wed, 26 Oct 2011 11:37:49 GMT
Server: Apache/2.2.20 (Unix) mod_ssl/2.2.20 OpenSSL/
0.9.8r DAV/2 PHP/5.3.6
Last-Modified: Sat, 06 Nov 2010 21:12:21 GMT
ETag: "1144085-d9-49468d8c2d740"
Accept-Ranges: bytes
Content-Length: 217
Content-Type: text/html

<!DOCTYPE html>
<html>
        <head> … … </body>
</html>
```

Passing CGI-Style Parameters in GET Request

- Convention for passing parameter values to server-side programs
  - Introduced by the *Common Gateway Interface (CGI)*
  - Not part of the HTML protocol!
  - Interpreted by server programs, e.g. PHP module
- Syntax:
  - Parameter data stream is appended to URL after a “?”
  - Keyword/value pairs, separated by “=”, e.g. “**`fibinput=12`**”
  - Multiple parameter groups are separated by “&”
  - Spaces in strings are replaced by “+”
  - Non-ASCII characters (and special characters “&”, “+”, “=”, “%”) are replaced by “%*xx*” (hexadecimal code of character in used character set)

Example GET Request with Parameter

- Request:

```
GET /~hussmann/fibonacci2b.php?fibinput=12 HTTP/1.1
Host: localhost
```

- Response:

```
HTTP/1.1 200 OK
Date: Wed, 26 Oct 2011 11:57:45 GMT
Server: Apache/2.2.20 (Unix) mod_ssl/2.2.20 OpenSSL/0.9.8r
DAV/2 PHP/5.3.6
X-Powered-By: PHP/5.3.6
Content-Length: 338
Content-Type: text/html

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//
EN"
        "http://www.w3.org/TR/html4/loose.dtd">

<html>
<head> … fib(12) = 144 … </html>
```

GET and POST Methods in HTTP

Hypertext Transfer Protocol (HTTP) supports two methods for passing parameter values to called documents/scripts:

- GET Method:
  - Values of variables coded and transmitted within URL:
    `http://host.dom/pfad/fibonacci2.php?fibinput=12`
  - Parameters can be passed just by creating a certain URL (without forms)
  - Suitable for simple requests
- POST Method:
  - Values of variables coded and transmitted in the HTTP message body data
  - Values of variables not visible in URL
  - Web server reads parameter values from message (like browser reads HTML text)
- Variable encoding is not part of HTTP (but specified for HTML forms)
  - For POST requests, the coding method is given in the Content-Type header
    - » application/x-www-form-urlencoded (CGI conventions)
    - » multipart/form-data (segmented data, better for large data blocks)

Example POST Request with Parameter

- Request:

```
POST /~hussmann/fibonacci2b.php HTTP/1.1
Host: localhost
Content-Type: application/x-www-form-urlencoded
Content-Length: 11

fibinput=12
```

- Response:

```
HTTP/1.1 200 OK
Date: Wed, 26 Oct 2011 14:06:35 GMT
...
Content-Type: text/html

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//
EN"
        "http://www.w3.org/TR/html4/loose.dtd">

<html>
<head> … fib(12) = 144 … </html>
```

Fibonacci Function in PHP: Using Request Data

```
<body>
   <h1>
            Fibonacci Function (Result)
   </h1>
   <h2>
            <?php
                 $fibinput = $_REQUEST['fibinput'];
                 function fib($n){ as in version 1 };
                 echo "fib($fibinput) = ";
                 echo fib($fibinput);
                 echo "<br>";
            ?>
            <br>
            <a href="fibonacci2a.html">New Computation</
   a>
   </h2>
</body>
```

fibonacci2b.php

Variables, Parameter Passing and Security

- Global arrays **`$_REQUEST`**, **`$_GET`**, **`$_POST`**
  - for accessing external values determined at call time (like form input)
  - **`$_REQUEST`** contains all parameters given in request,
    `$_GET` and **`$_POST`** contains all parameters passed by the resp. method
  - Obtaining individual variable values by array lookup:
    `$_REQUEST['var'];`

- Older PHP versions (up to 4.2.0):
  - Huge security hole by not distinguishing between external parameters (e.g. input from HTML forms) and local variables
    - » External values were directly accessible through variables (like "**`$fibinput`**")
  - Manipulations of URL (GET parameter values) may enable setting of internal variables (e.g. “$authorization_successful”...!)
  - Old behavior can still be enabled by PHP server configuration

HTML Reminder: Forms

- User input in HTML:
  `<form>` Element
- Sub-element:
  - **`<input type=`*`ty`* **`name=`*`name`*`>`**
    Allowed types (*ty)* (selection):

`checkbox`	Check box (Attribute **`checked`**)
`radio`	Radio button (Attribute **`checked`**)
`text`	Textzeile
`textarea`	Multi-line text input area
`password`	Text input area not displaying the input
`file`	File selection
`button`	General button
`submit`	Button to send form contents
`reset`	Button to reset form contents

  - **`<select name=`*`name`*`>`** Pop-up menu for selection from options
    List of options: Sub-elements **`<option>`**
    `<option selected>` defines "pre-selected" values

HTML Form Example

```
<body>
    <form action="test.php"
          method="GET"
          enctype="application/x-www-form-urlencoded">
          <label>Name <input type="text" name="name"
                 maxlength="10"/></label><br>
          Sex:
          <input type="radio" name="sex"
                 value="male"></input> male
                 <input type="radio" name="sex"
                 value="female"></input> female <br>
          <input type="checkbox" name="married"
                 value="yes">Married</input><br>
          <input type="submit" value="Submit" />
    </form>
</body>
```

/test.php?name=Max+Muster&sex=male&married=yes

HTML Forms and Server-Side Scripts

- HTML page containing forms usually calls separate script page and transfers form data as variable values
- **`action`** attribute for HTML tag **`<form>`**
  - Specifies the server page to process the input
  - Can contain embedded script
- **`method`** attribute for HTML tag **`<form>`**
  - Specifies the HTTP method to be used to transfer form data to the server
  - Possible values: GET (default), POST
- **`enctype`** attribute for HTML tag **`<form>`**
  - Specifies the encoding method to be used for form data
  - Possible values:
    - » application/x-www-form-urlencoded (CGI conventions) (default)
    - » multipart/form-data (segmented data)

Example: POST Request with Multipart Encoding

- HTML:

```
<form action="test.php"
      method="POST" enctype="multipart/form-data">
```

- Generated HTTP request:

```
POST /en/html/dummy.php HTTP/1.1
Host: localhost ...
Content-Type: multipart/form-data;
boundary=---------------------------103832778631715
Content-Length: 355

-----------------------------103832778631715
Content-Disposition: form-data; name="name"

Max Muster
-----------------------------103832778631715
Content-Disposition: form-data; name="sex"

male
-----------------------------103832778631715
Content-Disposition: form-data; name="married"

yes
-----------------------------103832778631715--
```

Fibonacci Function in PHP (Version 2): Input Form Calling PHP Script

```
<body>
  <h1>
     Fibonacci Function (Input)
  </h1>
  <h2>
     Please enter number:
     <form name="fibform" action="fibonacci2b.php">
          <input type="text" name="fibinput"
            value="0"><br>
          <input type="submit" value="Compute">
     </form>
  </h2>
</body>
</html>
```

fibonacci2a.html

Combination of Input and Result Pages

```
<body>
  <h1>
     Fibonacci Function
  </h1>
  <h2>
     <?php
          function fib($n){  as above  };
          $eingabe = $_REQUEST['fibinput'];
          echo "fib($eingabe) = ";
          echo fib($eingabe);
          echo "<br>";
     ?>
     <br>
     Please enter number:
     <form name="fibform" action="fibonacci2.php">
          <input type="text" name="fibinput" value="0"><br>
          <input type="submit" value="Compute">
     </form>
  </h2>
</body>
```

fibonacci2.php

Embedding Media in HTML

- Media embedding requires:
  - Media data (a file)
  - Player software
- Typical media data:
  - Sound files (e.g. .wav, .mp3, .ogg, .midi)
  - Movie files (e.g. .avi, .mov, .ogv, .flv)
  - Programs to be executed on a virtual machine (“universal player”), e.g.:
    - » Java applets
    - » Flash runtime code (Shockwave Flash, .swf)
    - » Silverlight application packages (.xap)
- Browser integration:
  - Built-in: Browser "knows" about player for media type
  - Plug-in: Flexible association between player and media type
- Video on the Web is currently dominated by universal multimedia formats (in particular Flash)

Embedding a YouTube Video

```
<object width="500" height="315">
<param name="movie" value=
"http://www.youtube.com/v/_oBuE66majc&hl=de&fs=1&rel=0&border=1">
</param>
<param name="allowFullScreen" value="true"></param>
<param name="allowscriptaccess" value="always"></param>
<embed src=
"http://www.youtube.com/v/_oBuE66majc&hl=de&fs=1&rel=0&border=1"
type="application/x-shockwave-flash" allowscriptaccess="always"
allowfullscreen="true" width="500" height="315"></embed></object>
```

- Redundant information
  - Nested “object” and “embed” tags
- Adobe Flash runtime code referenced
  - MIME type “application/x-shockwave-flash”
  - Movie player program, parameterized

`<embed>` Tag in HTML

- **`<embed>`** tag refers to browser *plugin*
  - Introduced by Netscape with browser version 2.0
  - ***Outdated***, ***not*** part of the HTML standard
- Example:

```
<embed src="yippee.wav" width="140" height="60">
```

- Plugin:
  - Separate program to handle special file types
    - » E.g. Flash player plugin handles .swf files
  - Located on client
- Important attributes:
  - **`src:`** Data to be embedded (URI or local file)
  - **`width, height`** etc.: Control of appearance
  - **`autostart:`** Determines whether playback starts immediately
  - **`pluginspage:`** Where to find information on the plugin software
  - **`pluginurl:`** Where to find the plugin software

selfhtml.org

`<object>` Tag in HTML

- **`<object>`** : Generic solution to embed arbitrary data files
  - Part of HTML 4.0 and XHTML 1.0 standards, supported by Microsoft
  - Supports media files, files to be opened with separate application software, files to be opened with plugin software, executable programs (e.g. Java applets or ActiveX controls)
  - Not well supported in all browsers
- Example (modern standard-conform style):

```
<object data="nibbles.swf"
    type="application/x-shockwave-flash"
    width="600" height="400">
        <param name="movie" value="nibbles.swf">
        <param name="quality" value="high">
</object>
```

- Important attributes:
  - **`data:`** Data to be embedded (URI or local file)
  - **`width, height`** etc.: Control of appearance
  - **`type`**: MIME type of data
- Nested tag **`<param>`** to convey arbitrary name/value pairs

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More on the `<object>` Tag in HTML

- Further attributes:
  - **`classid:`** May be used to specify the location of an object's implementation via a URI. It may be used together with, or as an alternative to the `data` attribute, depending on the type of object involved.
    - » Specifies the version of the player software to be used
    - » In practice often platform specific, e.g. ActiveX registry values
  - **`codebase:`** Specifies the base path used to resolve relative URIs specified by the `classid`, `data`, and `archive` attributes. When absent, its default value is the base URI of the current document.
    - » In practice, misused to specify the location of the player software (like **`pluginurl`**)
  - **`codetype:`** Specifies the content type of data expected when downloading the object specified by `classid`.
    - » MIME type for code of player (not data)
- **`<object>`** tag with child tags in its body:
  - Uses the inner HTML code as display alternative

http://www.alistapart.com/articles/flashsatay/

Combining `<embed>` and `<object>`

- Problems:
  - Older browsers:
    - » Microsoft IE ignores **`<embed>`**
    - » Netscape/Mozilla ignores **`<object>`**
  - Current browsers:
    - » **`<object>`** as shown above works on all platforms
    - » However, Microsoft IE does not allow streaming of the data (but loads all data first)
- Pragmatic solution:
  - Enclosing an **`<embed>`** tag in an **`<object>`** tag (see above)
  - Recommended for Flash, stable
  - Not (X)HTML standard conform!
- Complex solution for Flash, standard conform:
  - Use portable **`<object>`** code from above
  - Load a container movie which then loads the target movie

http://www.alistapart.com/articles/flashsatay/

HTML 5

- HTML Version 5
  - Draft W3C standard (most recent draft 19 October 2010!)
  - Developed in parallel to XHTML 1.0
    - » XHTML 2.0 development has been stopped
- HTML 5 is partially supported already by many modern browsers
- HTML 5 contains standardized and simple media embedding tags
  - audio
  - video
  - embed

Audio Embedding in HTML 5

- Example:

```
<html> ...
      <body>
         ...
         <audio src="nightflyer.ogg" autoplay>
           Your browser does not support the <code>audio</code> element.
         </audio>
```

- Attributes (examples):
  - autoplay: Playback starts automatically
  - controls: Control UI elements are made visible
  - loop: Plays in an endless loop
  - preload: Hints about preloading expectations
- Subelement <source>:
  - Alternative way to specify data source
  - Multiple occurrence is possible, first supported version is taken

Video Embedding in HTML 5

- Example:

```
<html>
    <body>
       <video controls>
          Your browser does not support the <code>video</code> element.
          <source src="big_buck_bunny_480p_stereo.ogg" type="video/ogg">
           <source src="big_buck_bunny_480p_surround-fix.avi">
        </video>
```

- Additional Attributes compared to <audio> (examples):
  - height, width: Dimensions of video image
  - poster: Image to be shown until first frame becomes available
- Events (can be handled e.g. with JavaScript, examples):
  - empty
  - canplay
  - ended
  - abort
  - volumechange

<embed> in HTML 5

- HTML 5 contains a standardized version of the <embed> element
- Purpose:
  - Embed arbitrary content played back via plug-in software
- Examples:
  - Flash content
  - Java applets
- Not intended for media playback

Side Remark: HTML 5 vs. Flash

- HTML 5 establishes a clear alternative to Flash:
  - Simple audio and video playback
    - » Makes usage of Flash video for video portals unnecessary
  - Test version of YouTube portal for HTML5 video exists already
    - » Other video Web sites are more hesitating
- Still open issues:
  - File format/compression (see next slide)
  - Javascript interaction (e.g. for switching to full screen)
  - Content protection
  - Bandwidth adaptivity
- Alternative players to browser built-in player
  - Video JS
  - SublimeVideo
  - ...

Video Codecs and HTML5 Video

Browser	Latest stable release version date	Formats supported by different web browsers		
		Ogg Theora	H.264	VP8 (WebM)
Internet Explorer	9.0.2 (August 11, 2011; 2 months ago)	No[21]	9.0[22]	Manual install[note 2][note 3]
Mozilla Firefox[25]	7.0.1 (September 29, 2011; 26 days ago)	3.5[26]	No[note 4]	4.0[28][29]
Google Chrome	15.0.874.102 (October 25, 2011; 0 days ago)	3.0[30][31]	3.0[32] (will be removed)[33]	6.0[34][35]

en.wikipedia.org

- HTML5 Working Group: All browsers should support at least one common video format
  - Good quality & compression, hardware-supported, royalty-free!
- Problems with mainstream formats:
  - Patents on H.264
  - Fear of hidden patents for Ogg Theora
- Google:
  - Release of WebM to the public (after purchase of On2)
  - VP8 format with Vorbis audio in Matroska container

Chapter 2: Interactive Web Applications

Permanent Storage of Information

- Displayed content very often comes from server or client side storage
  - E-Commerce, E-Government, ...
  - Personalized pages
  - Discussion fora
  - ...
- Server-side storage:
  - Huge amounts of data (database)
    - » or simple files!
  - Data update by external software
  - Integration with arbitrary software systems
- Client-side storage:
  - Small amounts of data
  - Security-based restrictions (local information under user control)

Sessions and States

- HTTP is stateless
  - Server does not “remember” any data from previous transactions
- Linking several transactions to a “session” with common data storage
  - Client-side: Storing all data on client and re-transmit for every transaction
  - Server-side: Storing all data on server, client has to identify the session
- Common solution:
  - Server-side software offers session support
    - » E.g. session support in PHP
  - Client stores “session id”
  - Methods for linking request to session id:
    - » Variable/value pair in GET or POST request
    - » HTTP “Cookie”

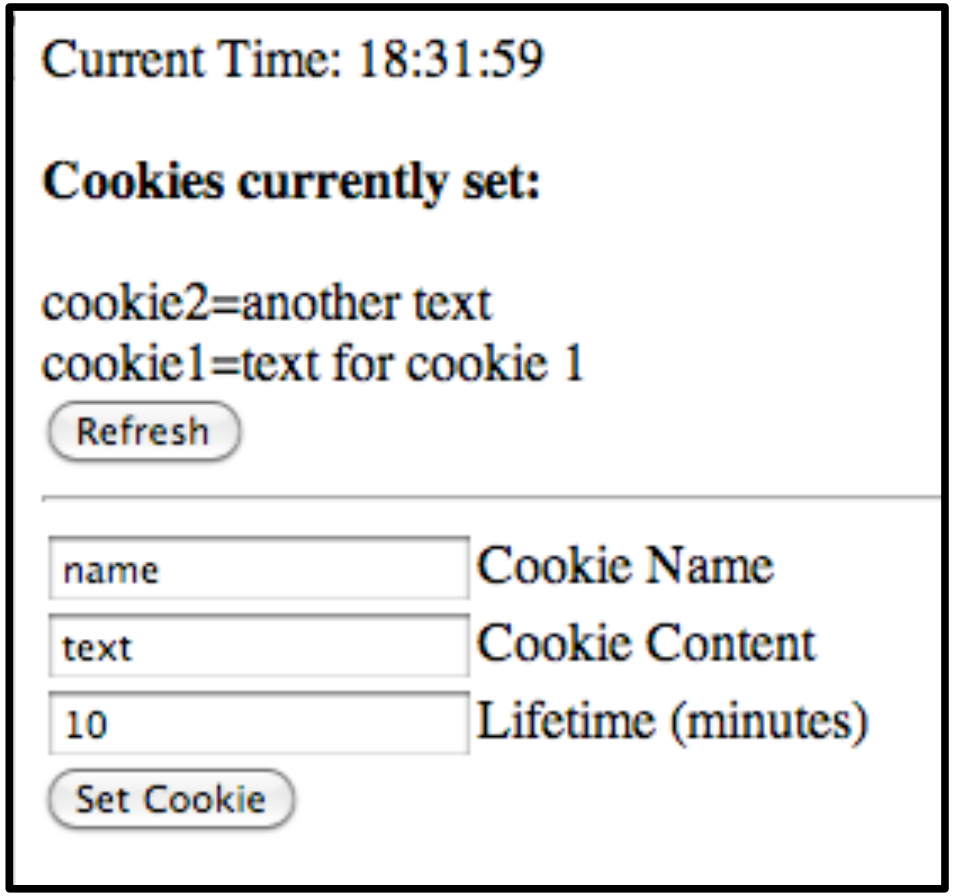
Cookies in HTTP

- Small data units stored in the browser storage area, controlled by browser
- Cookie contains:
  - *Name* (String), also called *key*
  - *Value* (String)
  - *Expiration date*
  - optional: domain, path, security information
- HTTP transfers cookies between client and server
  - In response, server can include header line “Set-Cookie:”
    - » Further information: name + value pair, expiration time
  - Cookie is stored by the browser
  - In further requests to the same server, client includes header line “Cookie:”
    - » Further information: name + value pair
  - Only cookies related to the requested server are transferred

Types of Cookies

- Session cookie
  - Deleted on browser termination
  - No expiration date given = session cookie
- Persistent cookie
  - For tracking, personalization
- Secure cookie
  - Only transmitted when secure connection to server is used
- HttpOnly cookie
  - Access only for HTTP, not for script APIs
- Third party cookie
  - Cookies set for different domain than currently visited server
  - Used for tracking and cross-domain advertising

Cookies in PHP: Screenshot



Accessing Cookies

Displaying a list of all cookies currently set (for this application) by reading from global array $_COOKIE:

```
<html>
  <?php
    date_default_timezone_set('Europe/Berlin');
    echo "Current Time: ", date("G:i:s"), "<br><br>\n";
    echo "<b>Cookies currently set:</b><br><br>\n";
    while (list($k, $v) = each($_COOKIE))
          echo $k, "=", $v, "<br>\n";
  ?>
...
</html>
```

HTML Form for Setting a Cookie

```
<form>
    <input type="text" name="key" value="name">
        Cookie Name<br>
    <input type="text" name="val" value="text">
        Cookie Content<br>
    <input type="text" name="tim" value="10">
        Lifetime (minutes)<br>
    <input type="submit" name="set"
        value="Set Cookie"><br>
</form>
```

- Page loaded via `action` is identical to page containing the form ("cookietest.php") – omitting the `action` attribute is sufficient.
- Due to server-side execution, the actual setting action can only be carried out when the next page is loaded!
- "`name`" attribute of `submit` button required for distinction to other buttons ("refresh" in the example).

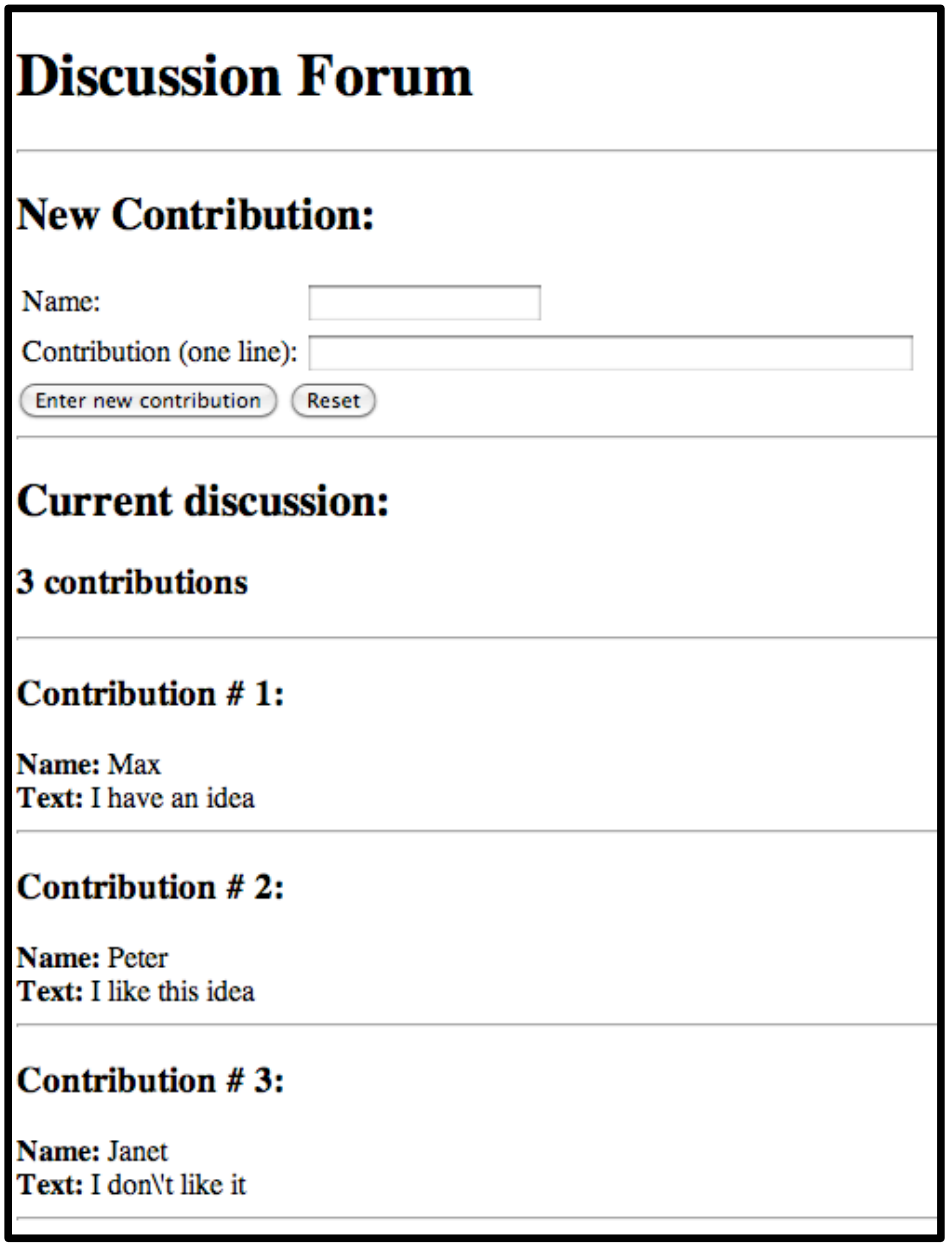
Setting the Cookie

```
<?php
   if ($_GET['set']) {
      $key = $_GET['key'];
      $val = $_GET['val'];
      $tim = $_GET['tim'];
      $exp = time() + $tim * 60;
      setcookie($key, $val, $exp);
   }
?>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01
 Transitional//EN" "http://www.w3.org/TR/html4/loose">
<html>
...
```

- "`name`" attribute of `submit` button used to decide whether "`set`" button was pressed
- setcookie() call has to be very first output of page, to be transmitted together with the headers (HTTP requirement).

A Simple Discussion Forum (1)

- Interactive submission of text contributions
- Display of all submissions available on server
- Server uses simple text file for storage
- Altogether approx. 50 lines of HTML+PHP !



A Simple Discussion Forum (2)

Contents of file "forum.txt":

- Each two consecutive lines represent one contribution.
- First line: Name
- Second line: Text

```
Max
I have an idea
Peter
I like this idea
```

A Simple Discussion Forum (3)

Display of the full content of the file 'forum.txt'

- Used file function:
  - **`file()`:** Converts file content to string array
- Used array function:
  - **`count()`:** Length of array

```
<h2>Current discussion:</h2>
<?php
   $content = file("forum.txt");
   echo "<h3>", count($content)/2, " contributions</h3>";
   echo "<hr>";
   $i = 0;
   while ($i < count($content)) {
       echo "<h3>Contribution # ", ($i+2)/2, ":</h3>";
           echo "<b>Name: </b>", $content[$i++], "<br>";
           echo "<b>Text: </b>", $content[$i++], "<br>";
           echo "<hr>";
           }
?>
```

forum.php

A Simple Discussion Forum (4)

Extending the file 'forum.txt' with a new contribution

- Parameter $newcontrib indicates whether the "enter contribution" button was pressed

- Used file functions:
  - `fopen(), fclose():` Open file ("a"=append), close file
  - `fputs():` Write string to file

```
<?php
  $newcontrib = $_REQUEST['newcontrib'];
  $name = $_REQUEST['name'];
  $contrib = $_REQUEST['contrib'];
  if ($newcontrib != "" && $name != "" && $contrib != "") {
     $file = fopen("forum.txt", "a");
     if ($file) {
           fputs($file,$name . "\n");
           fputs($file,$contrib . "\n");
           fclose($file);
     }
  }
?>
```

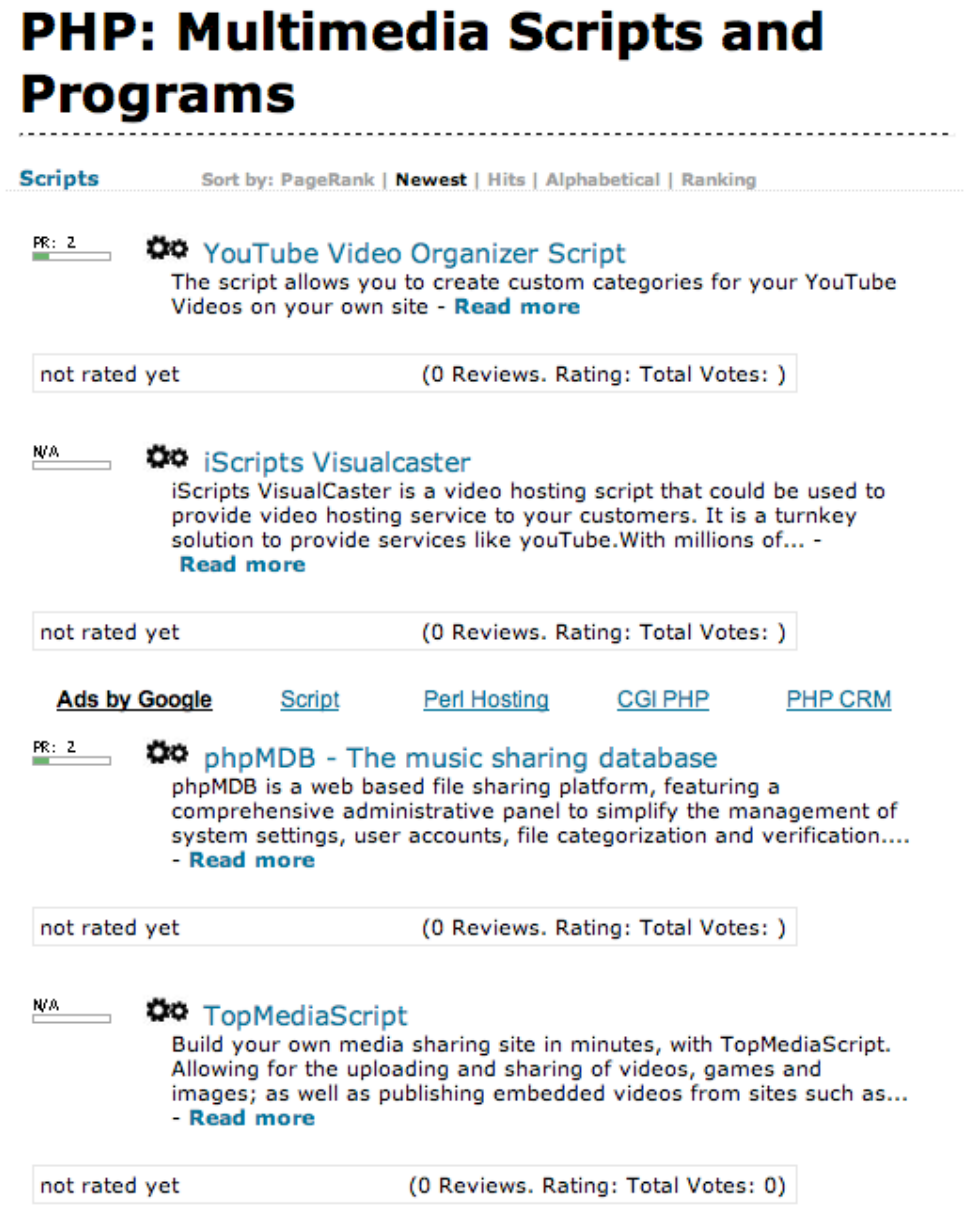
Potential Enabled by Server-Side Scripts

- Receive and store user input
  - In various forms of persistent storage
    - » Plain text files, XML files, data base
- Process input and compute results
  - Depending on various information available on server side
- Create output suitable for being displayed in Web browsers
  - HTML, may include JavaScript
- Make use of advanced features offered by Web browsers
  - Examples: Cookies, user agent identification

Applications to Multimedia

- PHP is not directly multimedia-related, but HTML-oriented
- HTML allows media embedding
- The combination of HTML + PHP + media embedding enables the creation of new digital media
- Examples for interactivity added to media playback, realizable by PHP scripts
  - Selection of media, e.g. search functions
    - » Using forms and backend data base
  - User-specific recommendations
    - » Using cookies
  - Aggregating (explicit and implicit) user input
    - » Frequency of use for individual media (charts)
    - » Correlation of use across media (collective recommendation)
    - » Tagging

Examples for PHP Multimedia Scripts



PHP: Multimedia Scripts and Programs

Scripts Sort by: PageRank | **Newest** | Hits | Alphabetical | Ranking

PR: 2

YouTube Video Organizer Script

The script allows you to create custom categories for your YouTube Videos on your own site - **Read more**

not rated yet (0 Reviews. Rating: Total Votes:)

N/A

iScripts Visualcaster

iScripts VisualCaster is a video hosting script that could be used to provide video hosting service to your customers. It is a turnkey solution to provide services like youTube.With millions of... - **Read more**

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www.webscriptsdirectory.com

Multimedia Functions in PHP Library (1)

- See e.g. Multimedia chapter of tutorial "Practical PHP Programming" http://www.tuxradar.com/practicalphp/11/0/0
- Example: Creating an image

```
<?php
    $image = imagecreate(400,300);
   // do stuff to the image
   imagejpeg($image, '', 75);
   imagedestroy($image);
?>
```

File: picture1.php

```
<HTML>
   <TITLE>PHP Art</TITLE>
<BODY>
   <IMG SRC="picture1.php" />
</BODY>
</HTML>
```

- Computer graphics functions, like:

```
$white = imagecolorallocate($image, 255, 255, 255);
imagefilledrectangle($image, 10, 10, 390, 290, $white);
```

Multimedia Functions in PHP Library (2)

```
<?php
    $image = imagecreate(400,300);
    $gold = imagecolorallocate($image, 255, 240, 00);
    $white = imagecolorallocate($image, 255, 255, 255);

    imagefilledrectangle($image, 0, 0, 400, 300, $gold);

    for ($i = 4, $j = 3; $i < 400; $i += 8, $j += 6) {
      imagefilledrectangle($image, $i, $j, 400 - $i, $j+3, $white);
    }

    imagepng($image);
    imagedestroy($image);
?>
```

Creating Flash Movies from PHP (1)

- ***Ming*** is an open-source library for creating SWF (Shockwave for Flash) movies from PHP scripts, using an object-oriented style.

```php
<?php
    $mov = new SWFMovie();
    $mov->setDimension(200,20);

    $shape = new SWFShape();
    $shape->setLeftFill($shape->addFill(0xff, 0, 0));
    $shape->movePenTo(0,0);
    $shape->drawLineTo(199,0);
    $shape->drawLineTo(199,19);
    $shape->drawLineTo(0,19);
    $shape->drawLineTo(0,0);

    $mov->add($shape);
    header('Content-type: application/x-shockwave-flash');
    $mov->output();
?>
```

```
<EMBED src="ming1.php" menu="false" quality="best" bgcolor="#FFFFFF" swLiveConnect="FALSE" WIDTH="200" HEIGHT="200"
TYPE="application/x-shockwave-flash" PLUGINSPAGE="http://www.macromedia.com/shockwave/download/index.cgi?
P1_Prod_Version=ShockwaveFlash">
```

Creating Flash Movies from PHP (2)

- Creating an animation (here animated text):

```php
<?php
    $font = new SWFFont("Impact.fdb");
    $text = new SWFText();
    $text->setFont($font);
    $text->moveTo(300, 500);
    $text->setColor(0, 0xff, 0);
    $text->setHeight(200);
    $text->addString("Text is surprisingly easy");

    $movie = new SWFMovie();
    $movie->setDimension(6400, 4800);

    $displayitem = $movie->add($text);

    for($i = 0; $i < 100; ++$i) {
        $displayitem->rotate(-1);
        $displayitem->scale(1.01, 1.01);
        $movie->nextFrame();
    }

    header('Content-type: application/x-shockwave-flash');
    $movie->output();
?>
```