HTTP Headers

Introduction

- When a web browser receives a web page it sends an HTTP request to the web server.

Typical HTTP Request

```
GET / index.html HTTP/1.1
Host: www.jacado.com
Accept-Encoding: UTF-8
User-Agent: Firefox/1.0
```

Introduction

- When the web server receives the browser's request, it processes the request and sends the HTTP response.

Typical HTTP Response

```
HTTP/1.1 200 OK
Server: Apache
Content-Type: text/html
Content-Encoding: UTF-8
Content-Length: 232332
[Data]
```

Introduction

- In addition to the core returned data (e.g. a requested HTML document), the server reply includes a set of response headers that contain information about the core returned data.
- An HTTP header is a simple string in the form of key:value.
- Each one of the headers is sent in a separated line.
- New line characters separate each one of the headers from the rest of the headers. A new line character separates the headers from the core returned data.

Introduction

- The PHP engine and the web server automatically take care of sending out the HTTP headers.

The `header()` Function

- The header() function allows sending back a raw of an HTTP header.

```
void header(String $string [,bool $replace
                            [,int $http_response_code]]
```

Usually, the $string can be one of the following three options:

The Content-type Option

We will use this option to set the mime type of the file our script sends back to the web browser.

```
<?PHP
header("Content-type: text/html");
?>
```

The `header()` Function

The “Location:” Option

We will use this option to send back a specific URL address we want to redirect the user to. When using this option it is highly important to ensure that there won't be any execution of any additional PHP code.

```
<?PHP
header(“Location: http://www.jacado.com“);
?>
```

The “HTTP/” Option

We will use this option to set a specific HTTP status code we want to return.

```
<?PHP
header(“HTTP/1.0 404 Not Found”);
?>
```

The `header()` Function

The $replace optional parameter indicates whether the new header we set should replace a previous header that was already set... or add a second header of the same type (with the same name). The default value of this parameter is “true”.

The $http_response_code optional parameter allows us forcing a specific status code value.

The header() function must be called before any other output... including any white spaces characters outside of the PHP tags. Avoiding this rule might result in a PHP error or a failure to complete our header() call successfully.

The `header()` Function

```
<?php
header("Content-Type: text/xhtml");
header("Expires: Mon, 22 Jul 2047 05:00:00 GMT");
echo "If you want to see the headers try to browse this
page via one of the following web based sniffers:"
echo "<BR>";
echo "http://webtools.mozilla.org/web-sniffer/";
echo "<BR>";
echo "http://www.delorie.com/web/headers.html";
echo "<BR>";
echo "http://www.rexswain.com/httpview.html";
?>
```

HTTP Compression

- The HTTP protocol supports the possibility to send data in a compressed form (using the gzip algorithm).
- The compression level (1..9) is configurable. The default level is 6.
- When a compressed data is sent back from the server, the Content-Encoding header is returned with the “gzip” value.

HTTP Compression

- The the following is a typical server reply that includes compressed data:

```
HTTP/1.1 200 OK
Server: Apache
Content-Type: text/html
Content-Encoding: gzip
Content-Length: 26395

[GZIP COMPRESSED DATA]
```

The `ob_start()` Function

- Calling the `ob_start()` function will turn on the output buffering.

```
bool ob_start ([ callback $output_callback
                        [, int $chunk_size [, bool $erase ]]])
```

Each one of the three parameters is optional. The $output_callback parameter allows us setting the name of another function that will receive one string parameter and return a string. That other function will be called before the data is sent back to the client. The reply of that other function will be the one that eventually the client will get.

The `ob_start()` Function

Passing a value to the $chunk_size parameter will cause the buffer to be flushed after any output call that causes its buffer's length to be equal or to exceed the $chunk_size value. Passing $chunk_size the value 0 will cause the buffer to be sent back to the user only in the end. Passing 1 will set $chunk_size to be 4096.

Passing the 'false' value to the 'erase' optional parameter ensures the buffer will not be deleted until the script ends.

The ob_start() function returns 'true' if it succeeded in its work, and 'false' if it fails. (e.g. couldn't find the callable_function).

The `ob_gzhandler()` Function

- The `ob_gzhandler()` is the `ob_start()` callback function we should use to gzip the output buffer.
- Calling the `ob_start("ob_gzhandler")` will turn on the output buffering and cause the script's output to be compressed before it returns back to the client.

```
string ob_gzhandler ( string $buffer , int $mode )
```

If according to the client request headers the PHP engine understands that the client browser is not capable of receiving compressed data this method returns false.

The `ob_gzhandler()` Function

```
<?php
ob_start("ob_gzhandler");
?>
<html>
<body>
<p>
If your browser supports receiving compressed data
then this page was received in a compressed format.</p>
</html>
<body>
```

The `php.ini` Compression Setting

- We change the compression behavior using the php.ini setting file.

Browser's Caching

- Most browsers cache as much of the content they download as possible. This way the user receives the requested content in a faster way. The user experience improves.
- Using the “Cache-Control” and the “Expires” headers it is possible to instruct the browser how to cache the output our script returns.

```
header(“Cache-Control: no-cache, must-revalidate”);
header(“Expires: Mon, 31 Jan 2008 02:55:22 GMT”);
```

Browser's Cookies

- A browser cookie is a small amount of textual data the browser has received from a specific web server.
- Each cookie has a name and a value. In addition, it includes various meta data.
- Setting a cookie within a specific web browser is done using specific HTTP header, the web server includes in its reply.

Browser's Cookies

- Each time a web browser sends an HTTP request to a web server (the one that has set up the cookie/s) and assuming that cookie is still alive, the browser will include that cookie (cookies) in its request.

The `setcookie()` Function

- The `setcookie()` function allows us setting a cookie on the client's browser.

```
bool setcookie ( string $name [, string $value [, int $expire
                [, string $path [, string $domain
                [, bool $secure [, bool $httponly ]]]]]] )
```

As with other headers related functions it is a MUST to ensure that this function is called before any output (including HTML tags and white spaces) is written back from our script. All parameters (except for $name) are optional.

The `setcookie()` Function

```
setcookie("id","1000232");
```

This code sets in client's browser a cookie with the name "id" and the value "1000232". That cookie will live as long as the session is alive. Once the session ends, that cookie will be deleted. In order to have a cookie that continue to live after the session ends and persists between sessions we need to pass an expiration date in our call to the setcookie function.

```
setcookie("id","1000232",time()+86400*3);
```

This code will instruct the browser to try and keep the cookie for 3 days.

The `setcookie()` Function

The $path argument allows us setting a path on our website (relative to our website's root director). When setting that path, the cookie will be accessible in that path only. The browser will send a cookie to pages within that path only.

The $secure boolean parameter allows us ensuring the browser will send the new created cookie when communicating via HTTPS only.

Accessing Cookies

- When a web browser sends a request to a web server, the PHP engine automatically separates the cookies from the HTTP headers and places them within the $_COOKIE super global array.

```
$id_val = $_COOKIE['id'];
```

This code returns puts the value of the 'id' cookie within the id_val variable.

Cookie Array Values

- Though the cookie value must be a scalar value (one value only), it is possible to create a cookie its value is an array via the same technique used for creating parameters with a value that is an array of other values.

```
setcookie(“names[0]”,”moshe”);
setcookie(“names[1]”,”david”);
setcookie(“names[2]”,”john”);
```

This code creates a cookie that its value is an array that contains three values: “moshe”, “david” and “john”.

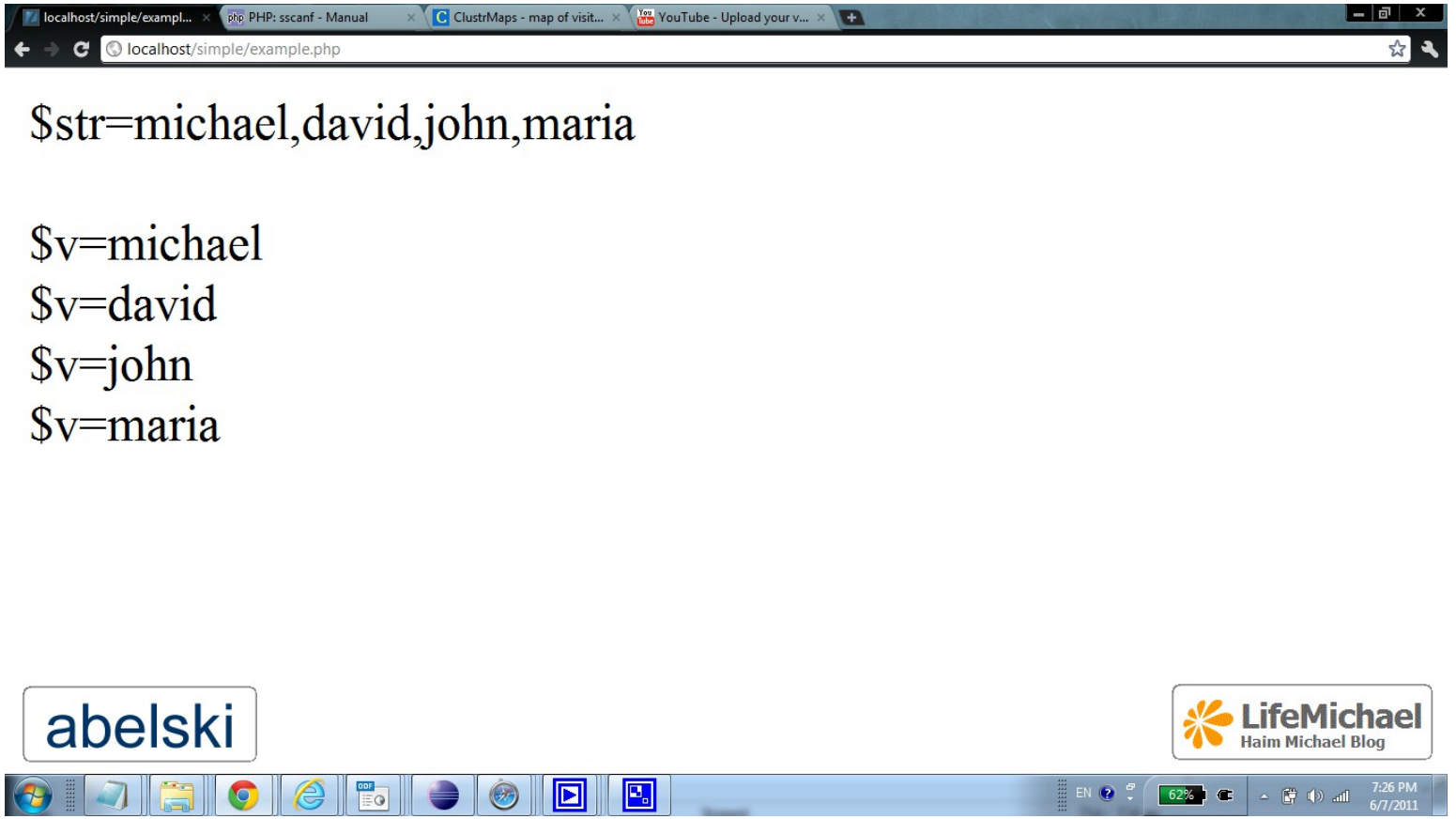
Cookie Array Values

- An alternative way for setting an array values as a cookie value includes the usage of the `implode` and the `explode` functions.
- The `implode` function receives two arguments.. an array of string elements and a string that will be used a the delimiter when creating a new string based on the array elements.
- The `explode` function performs the revers action taking a string composed of multiple string elements.

Cookie Array Values

```php
<?php
$vec=array("michael","david","john","maria");
$delimiter=",";
$str=implode($delimiter,$vec);
echo "\$str=$str";
echo "<br>";
$array=explode($delimiter,$str);
foreach($array as $k => $v)
{
    echo "<br>\$v=$v";
}
?>
```

Cookie Array Values



Cookie Deletion

- There is no way to delete a cookie. There is no way to instruct the browser to delete a specific cookie.
- Passing a negative value to the `$expire` parameter will effectively kill the cookie once the session ends.

HttpOnly Cookie

- HttpOnly cookies cannot be accessed using JavaScript. This type of cookies was introduced by Microsoft and today it is supported in most web browsers.
- The HttpOnly is an additional flag included in the Set-Cookie HTTP response header.

```
Set-Cookie: <name>=<value>[; <Max-Age>=<age>]
[; expires=<date>][; domain=<domain_name>]
[; path=<some_path>][; secure][; HttpOnly]
```

HttpOnly Cookie

- Calling the `setcookie` method we just need to pass over the value true to the httponly parameter. The default value of this parameter is false.

```
bool setcookie ( string $name
                 [, string $value
                 [, int $expire = 0
                 [, string $path
                 [, string $domain
                 [, bool $secure = false
                 [, bool $httponly = false ]]]]]] )
```

HTTP Headers

Introduction

- When a web browser receives a web page it sends an HTTP request to the web server.

Typical HTTP Request

```
GET / index.html HTTP/1.1
Host: www.jacado.com
Accept-Encoding: UTF-8
User-Agent: Firefox/1.0
```


With this request, the web browsers asks for the host "www.http-compression.com". The browser identifies itself as "Firefox/1.0" and informs that it understands HTTP responses in a UTF-8 format.

Introduction

- When the web server receives the browser's request, it processes the request and sends the HTTP response.

Typical HTTP Response

```
HTTP/1.1 200 OK
Server: Apache
Content-Type: text/html
Content-Encoding: UTF-8
Content-Length: 232332
[Data]
```


In this reply the web server replies the browser with the 200 status code, which indicates that it could fulfill the request. The next line identifes the web server as the Apache server. The “Content-Type” header tells the reply content type is html. The encoding UTF-8 tells the browser how it should treat and present the content. The last line tells the browser the length of the data. This way the browser can know when all data was received.

Introduction

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- Each one of the headers is sent in a separated line.
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- The header() function allows sending back a raw of an HTTP header.

```
void header(String $string [,bool $replace
                            [,int $http_response_code]]
```

Usually, the $string can be one of the following three options:

The Content-type Option

We will use this option to set the mime type of the file our script sends back to the web browser.

```
<?PHP
header("Content-type: text/html");
?>
```

The `header()` Function

The “Location:” Option

We will use this option to send back a specific URL address we want to redirect the user to. When using this option it is highly important to ensure that there won't be any execution of any additional PHP code.

```
<?PHP
header(“Location: http://www.jacado.com“);
?>
```

The “HTTP/” Option

We will use this option to set a specific HTTP status code we want to return.

```
<?PHP
header(“HTTP/1.0 404 Not Found”);
?>
```

The `header()` Function

The $replace optional parameter indicates whether the new header we set should replace a previous header that was already set... or add a second header of the same type (with the same name). The default value of this parameter is “true”.

The $http_response_code optional parameter allows us forcing a specific status code value.

The header() function must be called before any other output... including any white spaces characters outside of the PHP tags. Avoiding this rule might result in a PHP error or a failure to complete our header() call successfully.

The `header()` Function

```
<?php
header("Content-Type: text/xhtml");
header("Expires: Mon, 22 Jul 2047 05:00:00 GMT");
echo "If you want to see the headers try to browse this
page via one of the following web based sniffers:"
echo "<BR>";
echo "http://webtools.mozilla.org/web-sniffer/";
echo "<BR>";
echo "http://www.delorie.com/web/headers.html";
echo "<BR>";
echo "http://www.rexswain.com/httpview.html";
?>
```


You can find the code of this sample (header_sample.php) in the samples folder of this topic.

You can execute this code sample browsing at
http://www.abelski.com/courses/php/samples/headers/header_sample.php

This sample doesn't return any meaningful HTML code... it returns the headers only. In order to see the the returned headers you can try one of the following free web sniffers:
http://webtools.mozilla.org/web-sniffer/
http://www.delorie.com/web/headers.html
http://www.rexswain.com/httpview.html

HTTP Compression

- The HTTP protocol supports the possibility to send data in a compressed form (using the gzip algorithm).
- The compression level (1..9) is configurable. The default level is 6.
- When a compressed data is sent back from the server, the Content-Encoding header is returned with the “gzip” value.

HTTP Compression

- The the following is a typical server reply that includes compressed data:

```
HTTP/1.1 200 OK
Server: Apache
Content-Type: text/html
Content-Encoding: gzip
Content-Length: 26395

[GZIP COMPRESSED DATA]
```

The `ob_start()` Function

- Calling the `ob_start()` function will turn on the output buffering.

```
bool ob_start ([ callback $output_callback
                        [, int $chunk_size [, bool $erase ]]])
```

Each one of the three parameters is optional. The $output_callback parameter allows us setting the name of another function that will receive one string parameter and return a string. That other function will be called before the data is sent back to the client. The reply of that other function will be the one that eventually the client will get.

While output buffering is active no output is sent from the script (except for the headers), and the output is stored within an internal buffer.

The `ob_start()` Function

Passing a value to the $chunk_size parameter will cause the buffer to be flushed after any output call that causes its buffer's length to be equal or to exceed the $chunk_size value. Passing $chunk_size the value 0 will cause the buffer to be sent back to the user only in the end. Passing 1 will set $chunk_size to be 4096.

Passing the 'false' value to the 'erase' optional parameter ensures the buffer will not be deleted until the script ends.

The ob_start() function returns 'true' if it succeeded in its work, and 'false' if it fails. (e.g. couldn't find the callable_function).

The `ob_gzhandler()` Function

- The `ob_gzhandler()` is the `ob_start()` callback function we should use to gzip the output buffer.
- Calling the `ob_start("ob_gzhandler")` will turn on the output buffering and cause the script's output to be compressed before it returns back to the client.

```
string ob_gzhandler ( string $buffer , int $mode )
```

If according to the client request headers the PHP engine understands that the client browser is not capable of receiving compressed data this method returns false.

While output buffering is active no output is sent from the script (except for the headers), and the output is stored within an internal buffer.

The `ob_gzhandler()` Function

```
<?php
ob_start("ob_gzhandler");
?>
<html>
<body>
<p>
If your browser supports receiving compressed data
then this page was received in a compressed format.</p>
</html>
<body>
```

The `php.ini` Compression Setting

- We change the compression behavior using the php.ini setting file.

Introducing changes within ini.php file in order to set compression default behavior is the simplest way to activate the compression, and therefore it is also the recommend one.

Browser's Caching

- Most browsers cache as much of the content they download as possible. This way the user receives the requested content in a faster way. The user experience improves.
- Using the “Cache-Control” and the “Expires” headers it is possible to instruct the browser how to cache the output our script returns.

```
header(“Cache-Control: no-cache, must-revalidate”);
header(“Expires: Mon, 31 Jan 2008 02:55:22 GMT”);
```


Setting the “Cache-Control” header with the “no-cache, must-revalidate” value instructs the browser that it shouldn't cache any of the reply parts.

Setting the “Expires” header with a value, that is a detailed date & time that belong to the past, together with with setting the “Cache-Control” header with the “no-cache, must revalidate” will ensure the browser won't keep the returned data in its cache.

Each browser treats the HTTP headers relevant for caching in a different way. For that reason, setting both headers is the best way to ensure our reply is not cached.

Browser's Cookies

- A browser cookie is a small amount of textual data the browser has received from a specific web server.
- Each cookie has a name and a value. In addition, it includes various meta data.
- Setting a cookie within a specific web browser is done using specific HTTP header, the web server includes in its reply.

Browser's Cookies

- Each time a web browser sends an HTTP request to a web server (the one that has set up the cookie/s) and assuming that cookie is still alive, the browser will include that cookie (cookies) in its request.

The `setcookie()` Function

- The `setcookie()` function allows us setting a cookie on the client's browser.

```
bool setcookie ( string $name [, string $value [, int $expire
             [, string $path [, string $domain
             [, bool $secure [, bool $httponly ]]]]]] )
```

As with other headers related functions it is a MUST to ensure that this function is called before any output (including HTML tags and white spaces) is written back from our script. All parameters (except for $name) are optional.

Next time the client visits our server it is possible to access the cookies via the $_COOKIE and the $HTTP_COOKIE_VARS global variables arrays.

The `setcookie()` Function

```
setcookie("id","1000232");
```

This code sets in client's browser a cookie with the name "id" and the value "1000232". That cookie will live as long as the session is alive. Once the session ends, that cookie will be deleted. In order to have a cookie that continue to live after the session ends and persists between sessions we need to pass an expiration date in our call to the setcookie function.

```
setcookie("id","1000232",time()+86400*3);
```

This code will instruct the browser to try and keep the cookie for 3 days.

The expiration date should be passed to setcookie() in the UNIX timestamp format (number of seconds passed since January 1st 1970).

The `setcookie()` Function

The $path argument allows us setting a path on our website (relative to our website's root director). When setting that path, the cookie will be accessible in that path only. The browser will send a cookie to pages within that path only.

The $secure boolean parameter allows us ensuring the browser will send the new created cookie when communicating via HTTPS only.

The expiration date should be passed to setcookie() in the UNIX timestamp format (number of seconds passed since January 1st 1970).

Accessing Cookies

- When a web browser sends a request to a web server, the PHP engine automatically separates the cookies from the HTTP headers and places them within the $_COOKIE super global array.

```
$id_val = $_COOKIE['id'];
```

This code returns puts the value of the 'id' cookie within the id_val variable.

Cookie Array Values

- Though the cookie value must be a scalar value (one value only), it is possible to create a cookie its value is an array via the same technique used for creating parameters with a value that is an array of other values.

```
setcookie("names[0]","moshe");
setcookie("names[1]","david");
setcookie("names[2]","john");
```

This code creates a cookie that its value is an array that contains three values: "moshe", "david" and "john".

The amount of data a cookie value can hold is limited.

More info about the limits set by the Internet Explorer browser please visit at http://support.microsoft.com/kb/306070.

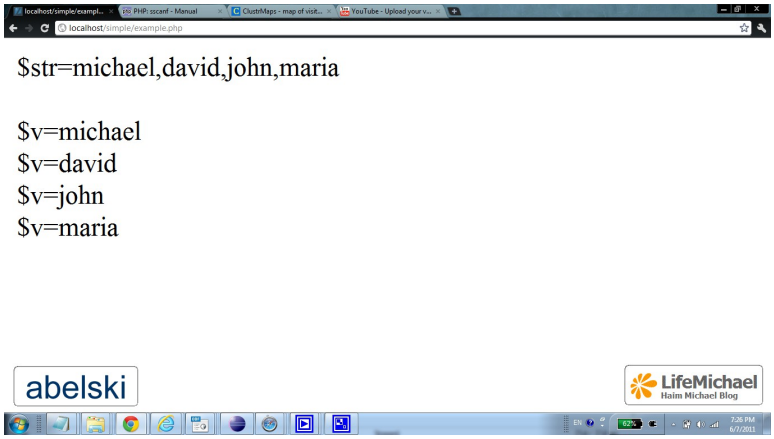
Cookie Array Values

- An alternative way for setting an array values as a cookie value includes the usage of the `implode` and the `explode` functions.
- The `implode` function receives two arguments.. an array of string elements and a string that will be used a the delimiter when creating a new string based on the array elements.
- The `explode` function performs the revers action taking a string composed of multiple string elements.

Cookie Array Values

```php
<?php
$vec=array("michael","david","john","maria");
$delimiter=",";
$str=implode($delimiter,$vec);
echo "\$str=$str";
echo "<br>";
$array=explode($delimiter,$str);
foreach($array as $k => $v)
{
    echo "<br>\$v=$v";
}
?>
```

Cookie Array Values



Cookie Deletion

- There is no way to delete a cookie. There is no way to instruct the browser to delete a specific cookie.
- Passing a negative value to the `$expire` parameter will effectively kill the cookie once the session ends.

HttpOnly Cookie

- HttpOnly cookies cannot be accessed using JavaScript. This type of cookies was introduced by Microsoft and today it is supported in most web browsers.
- The HttpOnly is an additional flag included in the Set-Cookie HTTP response header.

```
Set-Cookie: <name>=<value>[; <Max-Age>=<age>]
[; expires=<date>][; domain=<domain_name>]
[; path=<some_path>][; secure][; HttpOnly]
```

HttpOnly Cookie

- Calling the `setcookie` method we just need to pass over the value true to the httponly parameter. The default value of this parameter is false.

```
bool setcookie ( string $name
                 [, string $value
                 [, int $expire = 0
                 [, string $path
                 [, string $domain
                 [, bool $secure = false
                 [, bool $httponly = false ]]]]]] )
```