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How to secure your php application

Posted by [Stanislav Furman](#)  on February 21, 2012

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Working on web projects you should consider most common dangers such as XSS ("Cross Site Scripting"), SQL Injection, Session Hijacking, Spoofed Form Submissions, etc. This little guide will help you to understand basics of web security and it will help you to protect your web applications against possible attacks.

Remember that security must be balanced with expense. Don't use paranoid security approaches if it is not really needed.

Please note that this post covers only basic security approach which is quite enough for most of web sites but not enough for large, e-commerce projects. However, listed measures are fundamental for all types of web applications.

1. Do not display errors on your web site.

Turn off error displaying. Detailed error can give an idea how to attack your web site. Use log files and email notifications to be informed about any errors occurred on your web site. Make sure that you use something like this:

```
<?php
error_reporting(E_ALL ^ E_NOTICE);
ini_set('display_errors', 0);
ini_set('log_errors', 1);
ini_set('error_log', 'your_path/error_log.txt');
?>
```

2. Spoofed form submissions: check where the data

comes from.

Remember that incoming data can come not only from a form located on your website, but it also can come from a form created by another person outside your web server or web site. Look at this example:

```
<form action="myform.php" method="POST">
<select name="make">
    <option value="toyota">Toyota</option>
    <option value="honda">Honda</option>
    <option value="chevy">Chevrolet</option>
</select>
<input type="submit" value="Send data" />
</form>
```

Here you can see the HTML code of a form located on your web server. You suppose that only one of three car makes can come to your script. However, a hacker can create a form on his server or even his localhost:

```
<form action="http://yoursite.com/myform.php" method="POST">
<input name="make" type="text" />
<input type="submit" value="Send data" />
</form>
```

In a such way a hacker can send any data to your script. That's why it is very important to check where the data comes from. You can do it by using a random token stored in the session. Take a look at the following example.

PHP code:

```
<?php
// generate token
$_SESSION['token'] = md5(uniqid(mt_rand(), true));
?>
```

HTML code:

```
<form method="post" action="index.php">
<input name="token" type="hidden" value="<?=$_SESSION['token']?>" />
    ...
</form>
```

PHP code (after form submission):

```
<?php
if($_SESSION['token'] != $_POST['token'] || !isset($_SESSION['token'])) {
    die('Hacker?');
}
?>
```

3. Check your input data.

Check and filter all data that comes from input fields. Make sure that you check data types, data length and cut HTML tags from the incoming requests.

Trim data if needed. If you save first name and last name to the database, you don't need to save spaces before/after (users can add useless spaces accidentally).

```
<?php $username = trim($_POST['username']); ?>
```

Remove HTML tags if they shouldn't be there:

```
<?php $username = strip_tags(trim($_POST['username'])); ?>
```

Check the size of incoming data and cut it if needed:

```
<?php $language= substr($_POST['lang'], 0, 2); // Leave only first two
characters?>
```

Validate incoming data and make sure that data contains allowed values only:

```
<?php $language = (in_array($_POST['lang'], array('en', 'fr'))) ?
$_POST['lang']:'en'; ?>
```

Forcibly convert the data to proper type:

```
<?php $age = intval($_POST['age']); ?>
```

4. Do not insert unescaped strings to the database.

Use [mysql_real_escape_string\(\)](#) function instead of [addslashes\(\)](#) in order to secure your application from SQL injections:

```
<?php
$username = mysql_real_escape_string($_POST['username']); ?>
```

5. Do not store passwords in plain text!

Always use hashing functions such as [md5](#) or [sha1](#) to encrypt passwords.

```
<?php $password = md5($_POST['password']); ?>
```

In theory, if a hacker gains access to the password hash, he could use a "dictionary" of hashed words to find a hash that matches the user's one. Therefore, always use "salting" in order to better protect passwords saved in the database.

```
<?php
$salt = md5("a salt string that nobody knows");
$encrypted_password = md5( $password.$salt );
?>
```

Salted hashes can not be cracked by using a "dictionary" of hashed words because nobody knows with what string you have "salted" the password.

6. Check files that users upload on your site.

It is absolutely necessary to check all files that users can upload using your web site. Do not allow files that can be executed by a hacker (*.php, *.exe, *.js, etc). You could filter uploaded files by file extensions using the following example:

```
<?php
$allowedFileExtensions = array(
    'txt',
    'rar',
    'zip'
);
list($filename, $extension) = explode(".", $_FILES['image']);
if(!in_array($extension, $allowedFileExtensions)) {
    die('Sorry, this file can not be uploaded.');
```

You could also check MIME-types to filter files:

```
<?php
$allowedMimeTypes = array(
    'image/jpeg'
    'image/png',
    'image/gif'
);
$picture = $_FILES['image'];
if(!in_array($picture['type'], $allowedMimeTypes)) {
    die('Sorry, this file can not be uploaded.');
```

7. Protect files that people shouldn't see.

There are often some files (usually executable scripts) such as PHP libraries that you include to your application code. Usually these files have extensions like .php and can be executed by a `$_GET` request. Of course, it is not always dangerous, but it is always undesirable. You could use a protected folder to store such files. To protect the folder just place in it an `.htaccess` file with the following instruction:

```
deny from all
```

Now, if anybody will try to access any file from this folder, the server will return the HTTP error code 403.

8. Session hijacking and session fixation.

Session Hijacking is one of the most common types of attack. Therefore, it is very important to prevent this danger. In theory your session identifier can be captured and used by a hacker. Using your valid session identifier a hacker can send HTTP requests to your server so the server will think that it is you.

First of all, make sure that you have properly setup your php.ini file. Use [session.cookie-lifetime](#) and [gc-maxlifetime](#) to specify expiration time of a session cookie.

You can also control session lifetime in your PHP code. This method is very recommended. The idea is very simple - store the most recent activity time in the session and destroy session if new activity happened after limited time.

```
<?php
// Expire session after 30 minutes
if (isset($_SESSION['last_activity']) && (time() - $_SESSION['last_activity'] >
1800)) {
    session_destroy();
    session_unset();
}
$_SESSION['last_activity'] = time();
```

```
?>
```

For more protection you can regenerate session id, for example, every 15 minutes:

```
<?php
if (!isset($_SESSION['creation_time'])) {
    $_SESSION['creation_time'] = time();
} else if (time() - $_SESSION['creation_time'] > 900) {
    session_regenerate_id(true);
    $_SESSION['CREATED'] = time();
}
?>
```

Another method to prevent session hijacking is a permanent control of user's HTTP headers such as IP address and User-Agent. Usually, IP address doesn't change within a visit on your web site and the [User-Agent](#) always stays the same. That means that within a session we can simply store all this information and permanently check it in the code:

```
<?php
session_start();
if ( isset($_SESSION['HTTP_USER_AGENT']) && isset($_SESSION['REMOTE_ADDR']) )
{
    if(
        $_SESSION['HTTP_USER_AGENT'] != md5($_SERVER['HTTP_USER_AGENT'])
        || $_SESSION['REMOTE_ADDR'] != md5($_SERVER['REMOTE_ADDR'])) {
        header("location login.php");
    }
} else {
    $_SESSION['HTTP_USER_AGENT'] = md5($_SERVER['HTTP_USER_AGENT']);
    $_SESSION['REMOTE_ADDR'] = md5($_SERVER['REMOTE_ADDR']);
}
?>
```

9. Use HTTPS to protect data exchanging.

If you have a payment system on your website, it is strictly recommended to use [HTTPS](#) connection.

10. Advanced security measures.

There is no perfection in the world. As well as the perfect safety doesn't exist. Where high level safety is very important, I recommend to use more security measures that involves server administration skills. Consult the following article to secure your PHP application on server's level : [25 PHP Security Best Practices For Sys Admins](#).



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ve a form on index.php file and I added this line of code into it

```
$_SESSION["token"] = md5(uniqid(mt_rand(), true));.....
```

```
<input type="hidden" name="token" value="<?php echo $_SESSION["token"]; ?>" />.....
```

de processor.php I have this lines of code

```
if(isset($_SESSION['token']) && ($_SESSION['token']==$_POST['token'])){\
```

```
    set($_SESSION['token']);
```

```
    mail('email@domain.com');
```

I am still getting mail at email@domain.com from processor.php after I commented the the
1 html code from index.php

So are secured is the process you explained in 2

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