Zend Filter: A Secure Man's Best Friend

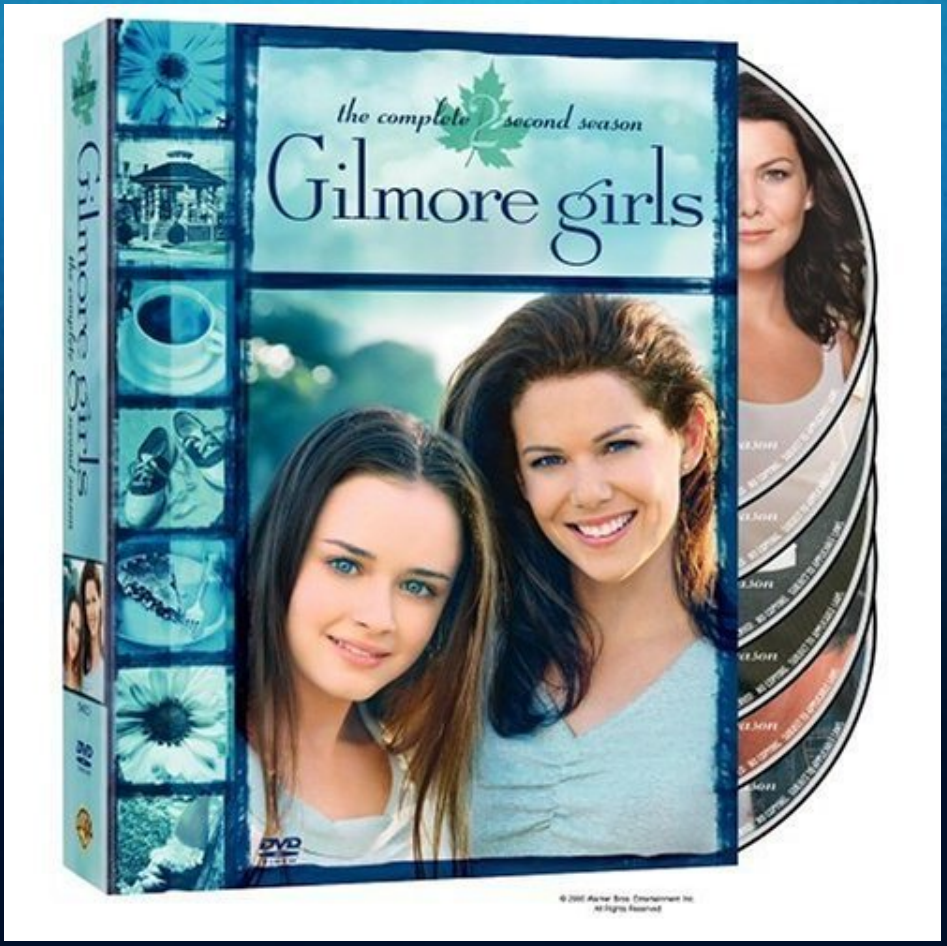
by Aaron Saray

Why Trust This Guy?

- Programmer for nearly 2 decades (can you say Commodore 64?)
- Web Developer for 11 / PHP for a decade
- "Professional PHP Design Patterns" - Wrox Publishing
- Milwaukee PHP Users Group / MWDM
- Cuz I said so

What is a Secure Man?

A secure man can admit to owning this:



Real Security

Filtering data!!

- User Input
- System Output
- Server Requests

The Point: Filter out "Bad" things

But what is bad?

- Bad is complex
- Bad is unexpected
- Bad is malicious
- Bad is "the old version"
- Bad is placeholders
- Bad isn't always bad

Why Filter?

- Filter anything that would adversely effect
  - security
    - xss
  - performance
  - business logic
    - dashes instead of dots
- Design Patterns:
  - filter is like decorate

What Does PHP Provide?

The Filter extensions (enabled by default since PHP 5.2.0)

Two filter types:

- Validate filters (referred to as Validators in ZF)
- Sanitize filters (removes unwanted data, Filters in ZF)

Some Useful/Notable Standard Filters

- FILTER_VALIDATE_EMAIL
  - duh
- FILTER_VALIDATE_IP
  - has flags for IPv4, IPv6, private/reserved ranges
- FILTER_VALIDATE_URL
  - according to RFC2396
- FILTER_SANITIZE_MAGIC_QUOTES
  - applies addslashes()

Example:

```
$userEmail = "someone@somewhere.com |oopsies";
$filteredEmail = filter_var($userEmail, FILTER_SANITIZE_EMAIL);
print $filteredEmail;


//output: someone@somewhere.com
```

Many more - check out http://php.net/filter

Getting into Zend Framework

- Using Zend Framework 1.11.9 for this presentation
- Get your own copy at http://framework.zend.com/download/latest
- Programmers are lazy - ZF from now on

What are Filters in relation to ZF?

- Zend Framework Filters are most akin to sanitize filters in PHP
- The core class is Zend_Filter
- Filter Classes implement Zend_Filter_Interface
  - primarily expose a filter() method
- Filters are built to be chained
- Three main ways to use ZF Filters...

Using ZF Filters: Zend_Form

```
class Application_Form_Signup extends Zend_Form
{
    public function init()
    {
        $this->addElement('text', 'email', array(
            'label'         =>'Email Address',
            'required'     =>true,
            'filters'     =>array('StringTrim', 'StringToLower'),
            'validators'=>array(
                'EmailAddress',
                array('StringLength', false, array(1, 250))
            ),
        ));

        $this->addElement('submit', 'submitbutton', array(
            'ignore'=>true,
            'label'=>'Sign Up Now',
        ));
    }
}
```

Using ZF Filters: Creating new instance

```
$filter = new Zend_Filter_Int();
$value = "6 fish";
echo $filter->filter($value);

//output: 6
```

Using ZF Filters: staticFilter() method

```
echo Zend_Filter::filterStatic('/var/www/ohhai.gif', 'BaseName');

//output: ohhai.gif
```

What's in the box?

- ZF comes with a set of standard filters
- Check them out here: http://framework.zend.com/manual/en/zend.filter.set.html
- Or for the more curious, check out the classes:
  - library/Zend/Filter

Some notable filters included in ZF:

- Zend_Filter_Compress
  - compress/decompress
  - various algorithms
- Zend_Filter_Digits
  - Filters for Digits - unicode regular expression
- Zend_Filter_Encrypt
  - Super easy way to handle MCrypt
- Zend_Filter_LocalizedToNormalized
  - Think $, date/time

even more notable filters included in ZF:

- Zend_Filter_HtmlEntities
  - converts your code into a pancake
- Zend_Filter_StringToLower
  - useful for cases like email addresses
- Zend_Filter_StringTrim
  - useful for forms to filter input fields of trailing spaces

Additional parts from Zend_Filter

Unfortunately, these are out of scope of this initial presentation:

- Chaining
  - Connecting many filters together
  - Changing order filters are applied
- Zend_Filter_Input
  - build complex set of filters/validators as parameters
  - apply all of them to input/array
- Zend_Filter_Inflector
  - build filter workflow on patterned strings
  - patterns similar to ZF router route string format

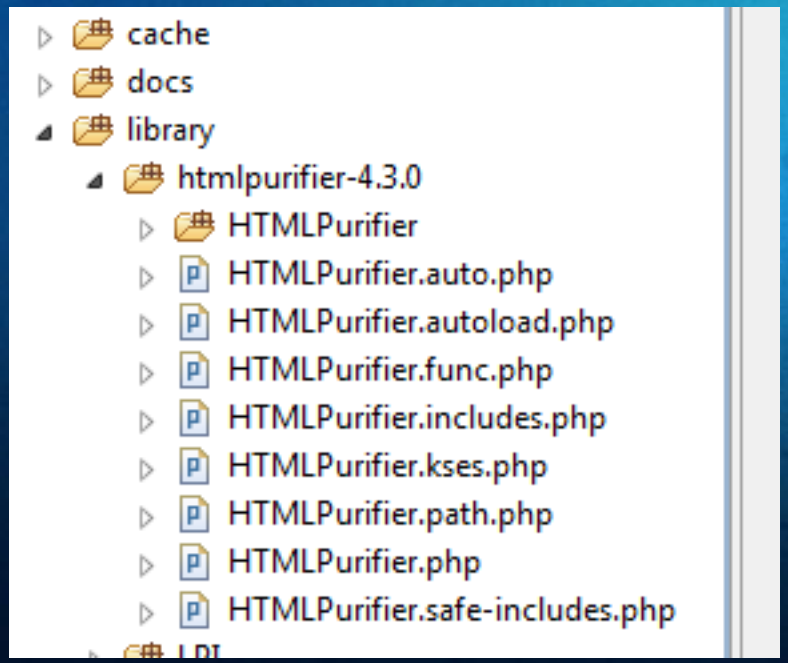
Real Life Time

- Problem: I need HTML input/output for my application. I'm using something snazzy like TinyMCE.
- Caveats:
  - Must allow some whitelisted html through
  - Must not allow for the hax0ring
- Initial findings:
  - HtmlEntities is somewhat helpful
    - pretty hammerish
  - StripTags is somewhat helpful
    - not precise enough

HTML Purifier

- I think HTML Purifier will solve my problem
  - http://htmlpurifier.org
- I want to use it in my ZF projects going forward
- I want it to be part of my "library" folder
- I want to do it the ZF way
  - Create an input filter with a Zend_Filter_Interface class

Add it to the Library



- Download it
- Add it to your library
  - I name mine by version

Basic Configuration

```
require_once 'htmlpurifier-4.3.0/HTMLPurifier.auto.php';
$config = HTMLPurifier_Config::createDefault();
$config->set('Cache.SerializerPath', '/path/to/cache');
$purifier = new HTMLPurifier($config);
$dirtyHTML = '<a href="/bar" onclick="alert('pwnd')">foo</a>';
echo $purifier->purify($dirtyHtml);
```

Output:

```
<a href="/bar">foo</a>
```

Create ZF Filter

- Create application/filters directory
- Register it in your bootstrap.php file with autoloader
  - So you can create new instances
  - Not necessary with forms
- Add it to your form definitions
  - So they can find it during filter stage
- Write filter

Add it to your Bootstrap Autoloader

```
protected function _initResources()
{
    $loader = $this->getResourceLoader();
    $loader->addResourceType('filter', 'filters', 'Filter');
}
```

Add it to your Form Class

```
<snippy>
public function init()
{
    $this->addElementPrefixPath(
       'Application_Filter',
       APPLICATION_PATH . '/filters/',
       'filter'
     );
</end snippy>
```

Write Filter Class

New file: application/filters/CleanHtml.php

```
class Application_Filter_CleanHTML implements Zend_Filter_Interface
{
   ....
}
```

```
/**
 * @var HTMLPurifier holds the instance of the purifier
 */
protected $_purifier = null;

/**
 * Filters the item
 * @param string $value
 * @return string filtered element
 */
public function filter($value)
{
     $this->_bootstrapPurifier();
     return $this->_purifier->purify($value);
}

/**
 * Start the purifier and store it locally
 */
protected function _bootstrapPurifier()
{
     ...
}
```

```
/**
 * Start the purifier and store it locally
 */
protected function _bootstrapPurifier()
{
    if ($this->_purifier == null) {
        require_once 'htmlpurifier-4.3.0/HTMLPurifier.auto.php';
        $config = HTMLPurifier_Config::createDefault();
        $config->set('Cache.SerializerPath', '/path/to/cache');
        $this->_purifier = new HTMLPurifier($config);
    }
}
```

All the code - for those with good eyes

```
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{
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     * @var HTMLPurifier holds the instance of the purifier
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    /**
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        if ($this->_purifier == null) {
         require_once 'htmlpurifier-4.3.0/HTMLPurifier.auto.php';
         $config = HTMLPurifier_Config::createDefault();
         $config->set('Cache.SerializerPath', '/path/to/cache');
            $this->_purifier = new HTMLPurifier($config);
        }
    }
}
```

Blog Entry? This is how I roll...

```
class Application_Form_Blog extends Zend_Form
{

<snippy>

    $this->addElement('textarea', 'body', array(
        'label' => 'Body Content',
        'required' => true,
        'validators' => array(
           array('StringLength', false, array(1,65000)),
         ),
        'class' => 'required mce',
        'maxlength'     =>  65000,
        'filters' => array('StringTrim', 'CleanHTML'),
    ));

</snippy>
```

The End

Say Hi!

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Download:
http://aaronsaray.com/blog/2011/07/20/zend-filter-presentation