Welcome!

About Me

- eZ systems A.S.
- Content Management: eZ publish
- Components Team

About This Talk

- Library Architecture
- Problems
- Some Useful Packages

Library Goals

- Provide a solid platform for PHP application development
- Clean and simple API
- Keep backward compatibility for longer periods of time
- Stable and few regressions

Development Goals

- Move to PHP 5
- Thoroughly plan the product to get a top notch API for the library.
- Thoroughly tested. All code should be covered by unit tests PRIOR to implementation.
- Make sure we keep the product open enough for future development
- Do proper documentation during the development.

What About PEAR?

PEAR is short for "PHP Extension and Application Repository" and is pronounced just like the fruit. The purpose of PEAR is to provide:

- A structured library of open-sourced code for PHP users
- A system for code distribution and package maintenance
- A standard style for code written in PHP, specified here

Problematic PEARs

- Categorization
- Interesting Naming
- No common API or naming

Rotten PEARs

- Not well tested
- Never finished
- Unfixed bugs
- Abandoned packages
- No documentation

Package Definition

- Package Description
- Version Information
- Files, and Install Paths
- Dependencies

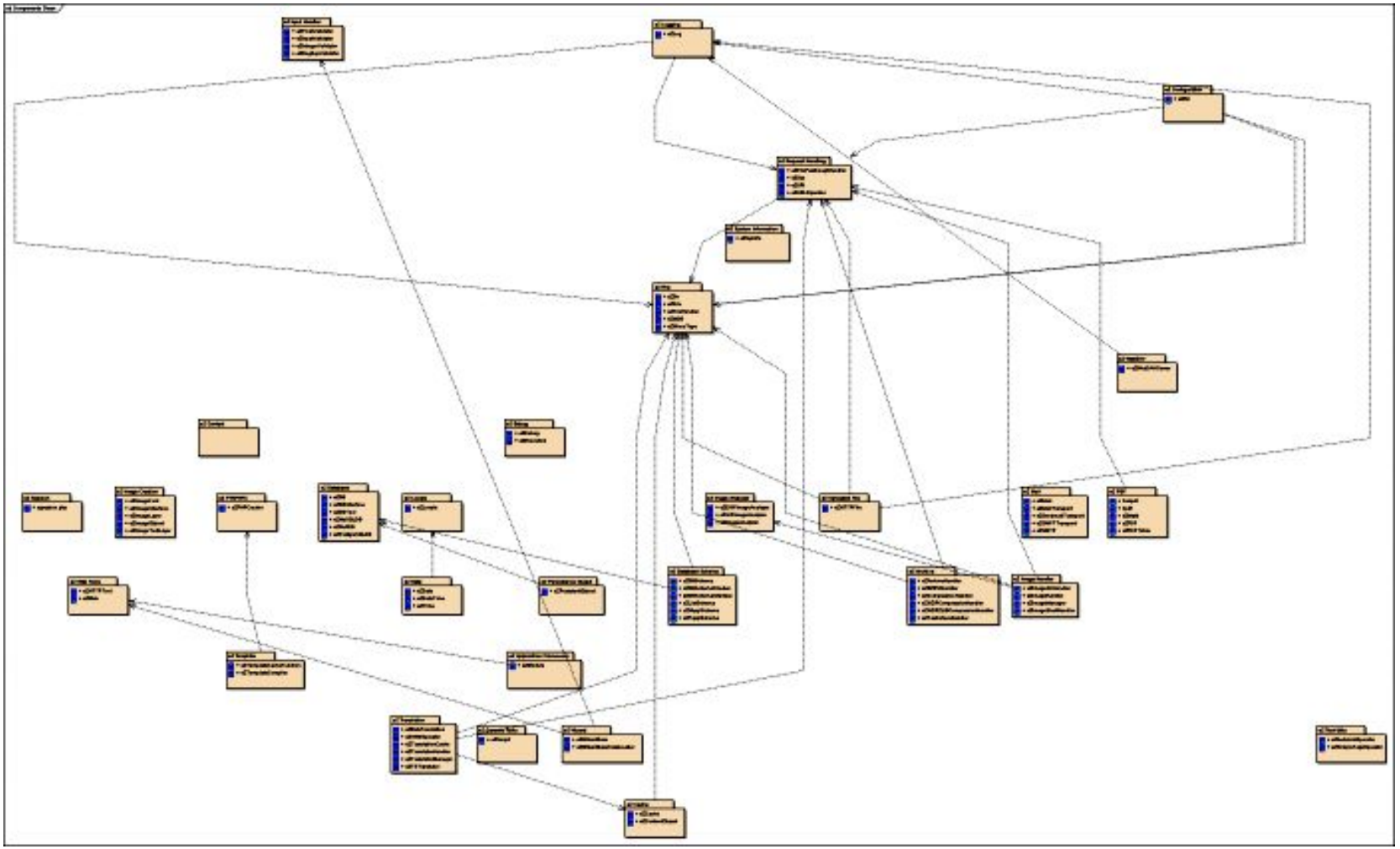
PEAR Channels

- Allows external entities to setup "PEAR" Servers
- Dependency Validation
- Aggregated Into http://pearaside.net

A channel defines:

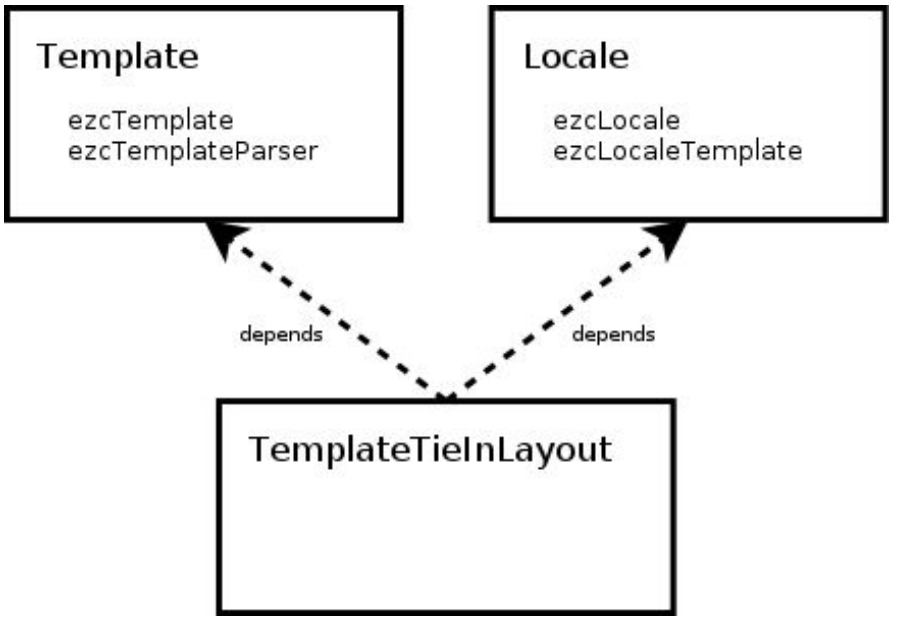
- The channel name.
- An optional suggested user alias for the channel.
- A brief summary of the channel's purpose.
- An optional package to perform custom validation of packages on both download and packaging.
- A list of protocols supported by a channel (XML-RPC, SOAP, and REST are supported).
- A list of mirrors and the protocols they support.

Original Dependencies

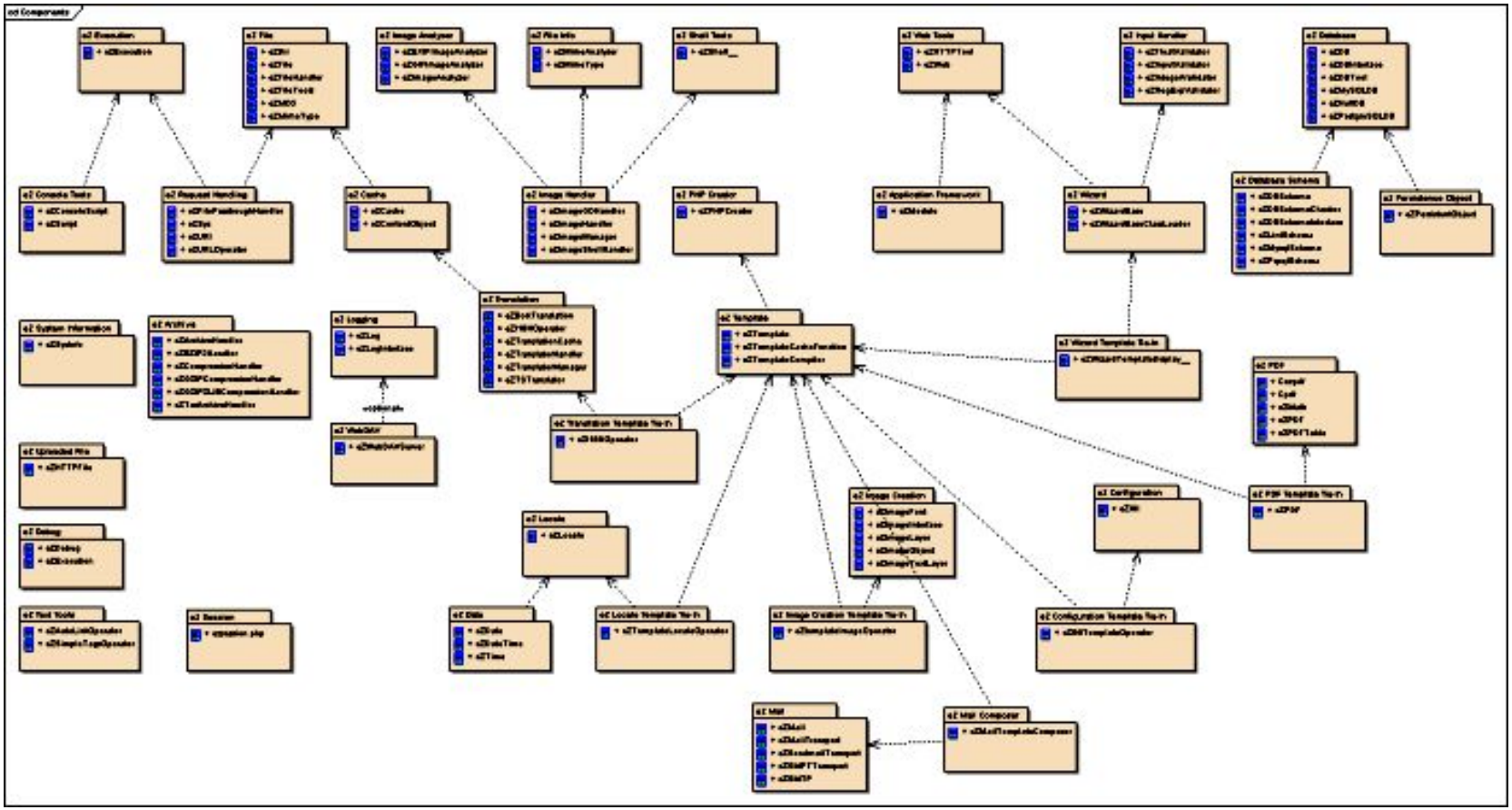


Dependencies

- The less the better
- Only if really necessary
- Dependency-only packages
- Tie-Ins



New Dependencies



Classnames

- Pre-fixed: for namespacing
- Readable: for sanity
- Slightly Mangled: for clarity

ezcMail vs. Mail

ezcTestSuite vs. PHPUnit2_Framework_TestSuite

ezcMailSmtpTransport vs. ezcMailSMTPTransport

Autoload

```
<?php
function __autoload( $className )
{
    $path = preg_replace( '/([A-Z])/', '/\\1', $className );
    $path = strtolower( $path );
    $path = str_replace( 'ezc/', '', $path ) . '.php';
    echo "Loading $path...\n";
    @include_once $path;
}

$a = new ezcMailSmtpTransport;
?>
```

Autoload Arrays

Using the classname's part as path elements makes ugly paths:

```
ezcMailTransportMta => mail/transport/mta.php
ezcMailTransportSmtp => mail/transport/smtp.php
ezcMailException => mail/exception.php
ezcMailTransportSmtpException => mail/transport/smtp/exception.php
```

More logical names (mail_autoload.php):

```
ezcMailTransportMta => transports/transport_mta.php
ezcMailTransportSmtp => transports/transport_smtp.php
ezcMailException => exceptions/mail_exception.php
ezcMailTransportSmtpException => exceptions/transport_smtp_exception.php
```

Some problems:

- Clashes in first part of the classname
- Needs installation into correct place for development

Autoload and Exceptions

```
<?php
    try
    {
    }
    catch( ezcA $e )
    {
    }
?>
```

This would always call the __autoload() function to load the exception class, even if it's not needed.

Documentation

Documentation:

- Makes a library usable
- API documentation
- Examples
- Test Cases

PHP Documentator:

- Made for PHP
- In use by PEAR
- Supported by PHP IDEs

Configuration

Current:

```
<?php
class eZTranslationCache {
    function cacheDirectory() {
        require_once 'lib/ezutils/classes/ezini.php';
        $ini =& eZINI::instance();
        $locale = $ini->variable( 'RegionalSettings', 'Locale' );
    }
}
?>
```

That would make almost all components depend on *eZINI*, and that's something we want to avoid.

New:

```
<?php
class ezcTranslationCache {
    protected $region;

    function __constructor( $region ) {
        $this->region = $region;
    }
}
```

Configuration

When there are a lot of options:

- Use constructor for most used ones
- Provide defaults for all others
- Add a *setOptions()* function that accepts an array with options

Debugging

Current:

```
<?php
function timestamp( $name )
{
if ( !isset( $this->Timestamps[$name] ) ) {
eZDebug::writeError( "...", '...::timestamp' );
return false;
}
return $this->Timestamps[$name];
}
?>
```

That would make almost all components depend on *eZDebug*, and that's something we want to avoid too.

New:

```
<?php
class ezcBase {
    function debug() { }
}

set_error_handler(array('ezcBase', 'debug'));
```

Component Versioning

Versions for components have three elements: x.y.z, which have the following meaning:

- *x*: major version number. A component with major version 0 can never be released publically (beta). It will only increase when there is a backwards compatible break in the component's API.
- *y*: minor version number, is used for all feature additions.
- *z*: mini version number, is used to denote bugfixes only. This third part can also be a string in the set: (alpha, beta1, beta2, beta*N*, rc1, rc2, rc*N*).

x and *y* show the version number of the component, the *z* is an addition showing the state (beta etc) or which bugfix release it is.

Component Versioning

- *0.1.0*: first non-publically released version
- *1.0.0*: first publically released version
- *1.0.1*: first bugfix release for component version "1.0"
- *1.3.7*: 7th bug fix release for version "1.3" - version "1.3" has more features compared to "1.0"-"1.2", but does not break BC
- *1.4beta1*: First beta release for "1.4".
- *1.4rc1*: First release candidate for "1.4".
- *1.4.0*: First production ready release of "1.4".
- *2.0alpha*: Development release, where backward compability is broken compared to version "1.x".
- *2.0beta1*: First beta release of "2.0".
- *2.0rc1*: First release candidate "2.0".
- *2.0.0*: First production ready release "2.0".

E_RECOVERABLE_ERROR

```
<?php
class Foo {
}

function blah (Foo $a)
{
}

function error()
{
$a = func_get_args();
var_dump($a);
}

set_error_handler('error');

blah (new StdClass);
echo "ALIVE!\n";
?>
```

- Used if there is a fatal error which doesn't leave the engine in an unstable state.
- If not handled in a user defined error handler -> E_FATAL.

What is Wrong Here?

```
<?php
    $sql = "
        SELECT card_num, card_name, card_expiry
        FROM credit_cards
        WHERE uid = '{$_GET['uid']}'
    ";
?>
```

```
http://example.com/script.php?uid=42
```

```
SELECT card_num, card_name, card_expiry
FROM credit_cards
WHERE uid = '42'
```

!

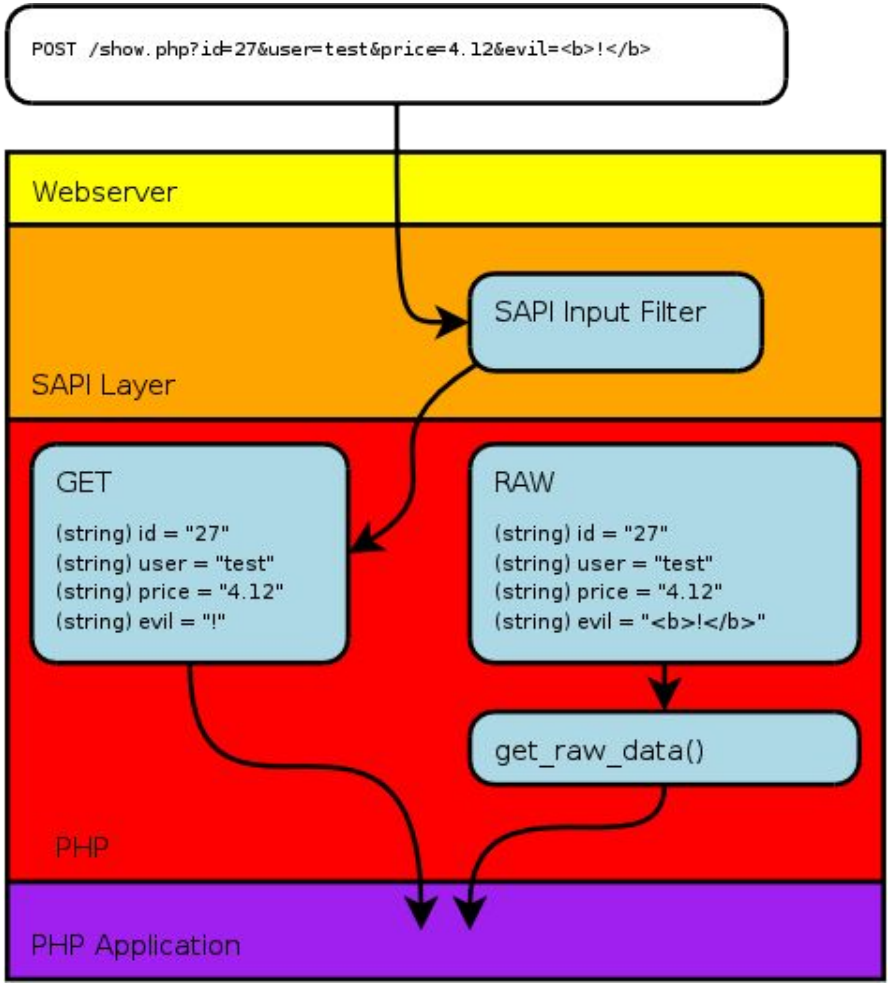
```
http://example.com/script.php?uid=42'%20or%20''='
```

```
SELECT card_num, card_name, card_expiry
FROM credit_cards
WHERE uid = '42' or ''=''
```

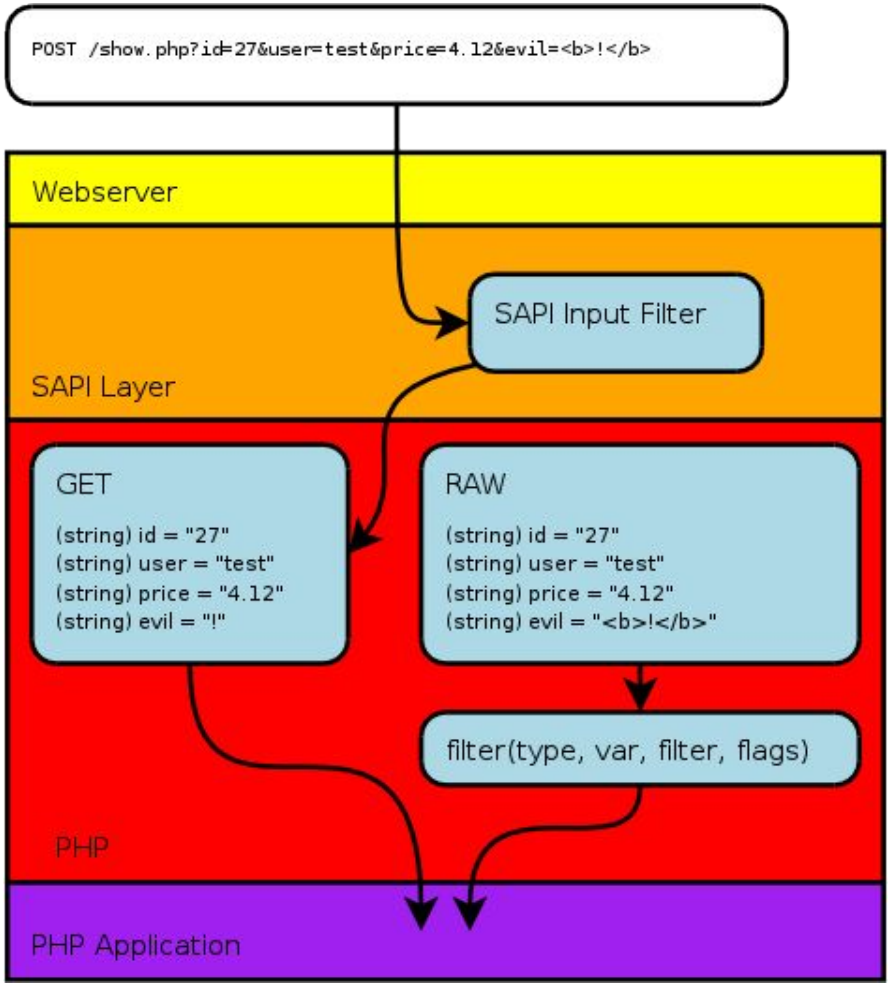
SAPI Input filter

- Sits between PHP and the webserver
- Is used while fetching data from users sources
- Can be used to filter data
- Prohibit data from entering PHP
- Written as a C extension to PHP
- Server wide filter

First Idea of an Input Filter



Second Idea of an Input Filter



Input Filter

```
mixed input_get (int source, string name, string filter
            [, mixed filter_options, [ string characterset ] ]);
```

- Returns the filtered variable $name from source $source. It uses the filter as specified in $filter, and additional options to the filter through $filter_options.

```
bool filter_data (mixed variable, string filter
            [, mixed filter_options, [ string characterset ] ]);
```

- Filters the user supplied variable $variable with the filter $filter using the options as specified in $filter_options. This function modifies the original variable, and returns false if the filter failed, or true if it was succesfull.

Input Filter

- *string*: Returns the input variable stripped of XML/HTML tags and other things that can cause XSS problems.
- *encoded*: Encodes all 'special' characters as URL encoded values.
- *special_chars*: Encodes all 'special' characters as XML entities.
- *unsafe_raw*: Returns the input variable as-is.
- *email*: Removes all characters that can not be part of a correctly formed e-mail address.
- *url*: Removes all characters that can not be part of a correctly formed URI.
- *number_int*: Removes everything [^0-9].
- *number_float*: Removes everything [^0-9.].
- *magic_quotes*: BC filter for people who like magic quotes.

Input Filter

- *int*: Returns the data as an integer.
- *boolean*: Returns true for '1' and true and 'false' for '0' and 'false'.
- *float*: Returns the data as a floating point value.
- *regexp*: Matches the input value as a string against the regular expression. If there is a match then the string is returned, otherwise the filter returns "false". Remarks: Only available if pcre has been compiled into PHP.

Transliteration

- Non-Latin scripts can't be used in a lot of cases, f.e.
- Extended-"ASCII" can also not be used
- Transliteration converts characters to other characters
- Existing extension in PECL: pecl/translit
- New extension based on ICU follows soon: i18n_translit

Transliteration

What we did first:

```
"HÃ¥tveit pÃ¥ 8. plass" to "h_tveit_p_8_plass"
```

What we do now:

```
"HÃ¥tveit pÃ¥ 8. plass" to "haatveit_paa_8_plass"
```

How we do this:

```
<?php
$string = "HÃ¥tveit pÃ¥ 8. plass";
$res = transliterate($string,
    array('normalize_ligature', 'lowercase_latin',
    'space_to_underscores'),
    'utf-8', 'utf-8');
?>
```

Transliteration

```
<?php
    $string = <<<END
След малко се запътвам към автобусната спирка, от там на
летището, после пак на летището и пак на автобусната спирка
и в Пловдив. Мозафока.
END;


    $string = iconv("utf-8", "ucs-2", $string);
    $res = transliterate($string, array('cyrillic_transliterate'));
    echo iconv('ucs-2', 'utf-8', $res);
?>
```

Transliteration

```
<?php
    $string = <<<END
美军总攻费卢杰 战况惨烈

מורדים בפלוג'ה משגרים רקטה בניסיון לעצור את הניסיון של כוחות
ארה"ב לכבוש את העיר תצלום: אי-פי

Υποθέτω πως για τους ενασχολούντες, η είδηση της βάφτισης
του linux kernel tree σε 2.6 στις 17 του Δεκέμβρη 2003 είναι
ήδη γνωστή.
END;

    $string = iconv("utf-8", "ucs-2", $string);
    $res = transliterate($string, array(
        'han_transliterate', 'hebrew_transliterate',
        'greek_transliterate'));
    echo nl2br(iconv('ucs-2', 'utf-8', $res));
?>
```

Normalization

```
<?php
    $string = <<<END
Normalization:
This example is called «normalization». It`s used to convert
“curly quotes”, special—hypens and other characters to more ‘ascii’
representations.

Removing diacritical marks:
Ḁṉőṱḫḝṙ ḟíḽṫḛṟ ṙéḿőṽ̉eṣ ḑḭḁḉṟịt̉ıçấḹ ṁã̄ṙḵṧ.
END;


    $string = iconv("utf-8", "ucs-2", $string);
    $res = transliterate($string, array(
        'normalize_punctuation', 'diacritical_remove'));
    echo nl2br(iconv('ucs-2', 'utf-8', $res));
?>
```

Other filters

```
<pre><?php
    $string = <<<END
decompose_currency_signs: € £ ¥
decompose_special: © ± « »

normalize_numbers:  .   *     .    +


han_transliterate:

uppercase_cyrillic: След малко се запътвам
END;


    $string = iconv("utf-8", "ucs-2", $string);
    $res = transliterate($string, array(
        'decompose_currency_signs', 'decompose_special',
        'normalize_numbers', 'han_transliterate',
        'uppercase_cyrillic', 'normalize_ligature',
        'diacritical_remove'));
    echo iconv('ucs-2', 'utf-8', $res);
?>
```

Problems

One identifier can mean different zones:

- PST: *P*acific *S*tandard *T*ime, *P*akistan *S*tandard *T*ime
- EST: *E*astern *S*tandard *T*ime (USA), *E*astern *S*tandard *T*ime (Australia) and *E*astern Brazil *S*tandard *T*ime

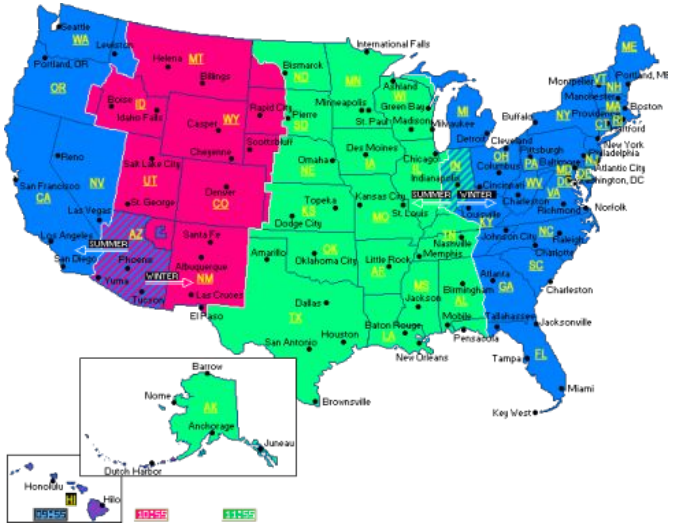
One zone can have multiple identifiers

- Central Europe Summer Time: CEST or CETDST

Names can be different on Operating Systems

Problems

- Artificial time offset to save "daylight"
- Not all countires/areas use it
- Switches are not done at the same time for all areas
- There are plenty of exceptions



Date/Time Functions in PHP 4 and PHP 5.0

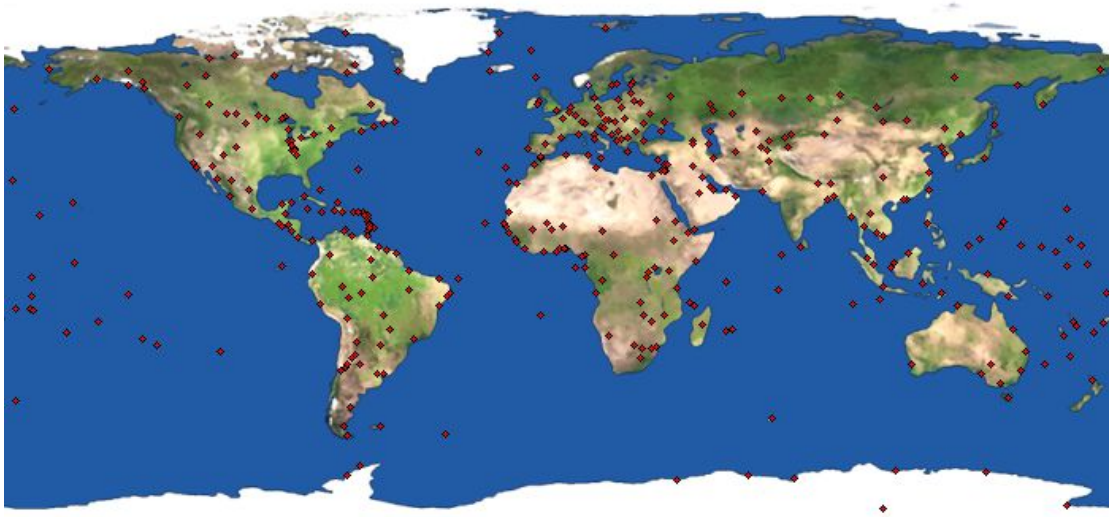
- Uses Unix timestamp as base unit (seconds since 1970-01-01, 00:00 GMT)
- Only 32 bit integers for timestamps (1902 to 2038)
- Limited to only positive numbers on some Operating Systems (1970 to 2038)
- *strtotime()* is buggy and very complex
- No way of dealing correctly with timezones
- Some functions are Operating System dependent

Date/Time Functions in PHP 5.1

- 64 bit timestamps
- *strtotime()* has been rewritten
- Nothing is Operating System dependent
- Full support for timezones, DST, date modifications
- New format modifiers: e for timezone identifier and o for ISO Year
- Advanced date handling functions

Date/Time Functions in PHP 5.1

- Bundled timezone database with 533 zones
- Not dependent on timezone abbreviations
- Timezones have the format: Continent/Location or Continent/Location/Sublocation - Like: Europe/Amsterdam, America/Indiana/Knox



Parsing Dates - Take #2

Parsing strings for date time information with the *date_create()* function:

```
<?php
    $ts = date_create("2005-07-11 22:16:50");
?>
```

This function will not return the timestamp as an integer, but instead returns a Date object which is a wrapper around a 64 bit integer (with some additional functionality ofcourse).

Formatting Dates

Formatting using format specifiers:

```
<?php
    date_default_timezone_set("Europe/Oslo");
    $ts = date_create("1979-12-31 09:15");
    echo date_format($ts, "D Y-m-d H:i:s - \I\S\O \W/\Y: W/o"), "<br/>\n";
```

All format modifiers as supported by *date()* are supported too.

Predefined formats:

```
<?php
    date_default_timezone_set("Europe/Oslo");
    $ts = date_create("December 22nd, 2005 15:41");
    echo date_format($ts, DATE_ISO8601), "<br/>\n";
    echo date_format($ts, DATE_RFC1036), "<br/>\n";
    echo date_format($ts, DATE_RSS), "<br/>\n";
```

Modifying Dates

Modifying dates and times:

```
<?php
    date_default_timezone_set("Europe/Oslo");
    $ts = date_create("now");
    echo $ts->format(DATE_RFC2822), "<br/>\n";

    echo $ts->modify("+2 days");
    echo $ts->format(DATE_RFC2822), "<br/>\n";

    echo $ts->modify("third month");
    echo $ts->format(DATE_RFC2822), "<br/>\n";

    echo $ts->modify("Friday +3 weeks");
    echo $ts->format(DATE_RFC2822), "<br/>\n";

    echo $ts->modify("next friday");
    echo $ts->format(DATE_RFC2822), "<br/>\n";
?>
```

Using Timezones

Specifying timezone abbreviation while parsing:

```
<?php
    $ts = date_create("1978-12-22 09:15 CET");
?>
```

Using timezone abbreviations is deprecated, one should always use either a default timezone, or the full identifier.

Specifying timezone identifier while parsing:

```
<?php
    $ts = date_create("1978-12-22 09:15 Europe/Oslo");
?>
```

Default Timezones

Setting a default timezone:

```
<?php
    date_default_timezone_set("Europe/Oslo");
    $ts = date_create("1978-12-22 09:15");
    echo date_format($ts, "e");
?>
```

Getting a default timezone:

```
<?php
    $default_identifier = date_default_timezone_get();
    echo $default_identifier;
?>
```

Default timezone is 'guessed' in the following order:

- *date_default_timezone_set()* value
- TZ environment variable
- php.ini's date.timezone setting
- System's rendering of timezone abbreviation

Using Timezones

Creating a timezone resource:

```
<?php
    $tz = timezone_open("Asia/Singapore");
?>
```

Using the timezone when parsing a string with a date representation:

```
<?php
    $tz = timezone_open("Pacific/Honolulu");
    $ts = date_create("1978-12-22 09:15", $tz);
?>
```

A passed timezone object does not override a *parsed* timezone:

```
<?php
    $tz = timezone_open("Pacific/Honolulu");
    $ts1 = date_create("1978-12-22 09:15 CET", $tz);
    $ts2 = date_create("1978-12-22 09:15 Europe/Amsterdam", $tz);
?>
```

Using Timezones

Getting a timezone's name:

```
<?php
    $tz = timezone_open("Asia/Singapore");
    echo timezone_name_get($tz), ', ';

    $tz = timezone_open("CEST");
    echo $tz->getName();
?>
```

Getting the current offset to GMT with a timezone for a specific date:

```
<?php
    $tz = timezone_open("Europe/Amsterdam");
    $d = date_create("2005-01-22 09:15");
    echo timezone_offset_get($tz, $d), ', ';
    $d->modify("+6 months");
    echo $tz->getOffset($d);
?>
```

Using Timezones

Using the timezone when parsing a string with a date representation:

```
<?php
    $tz1 = timezone_open("Pacific/Honolulu");
    $tz2 = timezone_open("Europe/Amsterdam");
    $tz3 = timezone_open("Australia/Melbourne");

    $ts = date_create("1978-12-22 09:15", $tz1);
    echo $ts->getTimezone()->getName(), ': ',
        $ts->format(DATE_RFC822), "<br/>";

    $ts->setTimezone($tz2);
    echo $ts->getTimezone()->getName(), ': ',
        $ts->format(DATE_RFC822), "<br/>";

    date_timezone_set($ts, $tz3);
    echo timezone_name_get(date_timezone_get($ts)), ': ',
        date_format($ts, DATE_RFC822);
?>
```

Timezones Utilities

Creating a timezone resource:

```
<?php
    $tz = timezone_open("Europe/Amsterdam");
    $trs = timezone_transistions_get($tz);
    $trs = $tz->getTransistions();

    echo "<pre>\n";
    foreach ($trs as $tr) {
        printf("%20s %7d %d %s\n",
            $tr['time'], $tr['offset'],
            $tr['isdst'], $tr['abbr']);
    }
?>
```

Timezones Utilities

All supported timezone idenfiers:

```
<?php
    $ids = timezone_identifiers_list();
    echo "Number of identifiers: ", count($ids), "<br/>";
    echo implode(", ", array_slice($ids, 0, 5)), '...';
    echo implode(", ", array_slice($ids, -5));
?>
```

All supported timezone idenfiers:

```
<?php
    $abbrs = timezone_abbreviations_list();
    echo "<pre>\n";
    foreach ($abbrs as $abbr => $id) {
        printf("%-4s %6d %d %s\n", strtoupper($abbr),
            $id['offset'], $id['dst'], $id['timezone_id']);
    }
?>
```