Modular Application Architecture

Confoo.ca 2012

Tobias Schlitt (@tobySen)

March 2nd 2012

About me

- Degree in computer sience

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- More than 10 years of professional PHP

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- More than 10 years of professional PHP
- Open source enthusiasts
- Contributing to various FLOSS projects

Co-founder of

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Helping people to create high quality web applications.

Co-founder of

Qafoo
passion for software quality

Helping people to create high quality web applications.

- Expert consulting
- Individual training
- …

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`http://qafoo.com`

Outline

Motivation

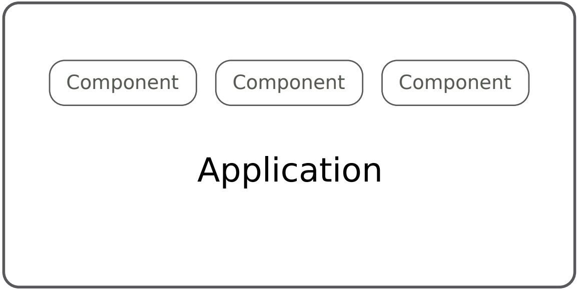
Resources

Approaches

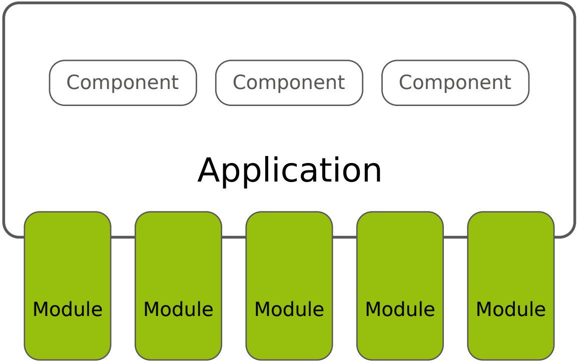
Real world

Summary

Application



Modules


Component
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Application
Module
Module
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Why modules?

- Need for customization
  - Custom setup for customers
  - 3rd party extensions

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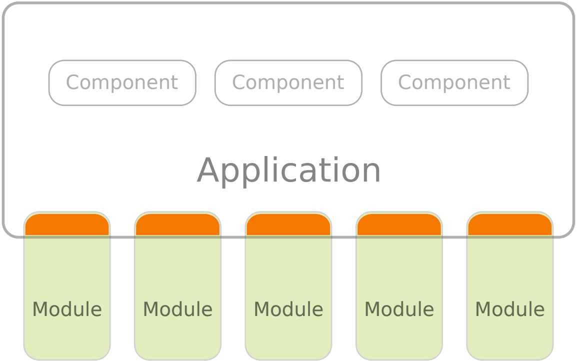
- Slag the main application
  - Raise maintainability

Essential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Challenges

- Module structure
- Registration / configuration
- Handling ressources
- Interaction with core

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Dealing with resources

- Typical module resources
  - Templates
  - Translations
  - Images
  - CSS

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- Typical module resources
  - Templates
  - Translations
  - Images
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- Resources handled by code are “easy”
  - Register “overrides“
- Static file resources are not
  - Put modules in a web accessible path?
  - Copy / link static files to `htdocs/`?
  - Pipe static files through PHP?
  - Webserver configuration?

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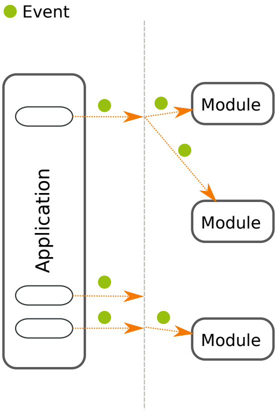
- Approaches
  - Event handling
  - Data handling

Event handling

- Interaction



Event handling

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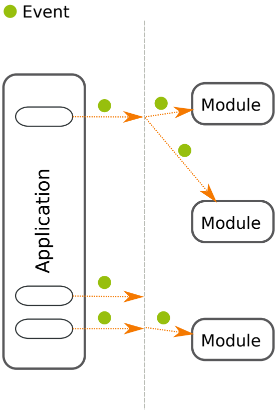
- Modules register for event types



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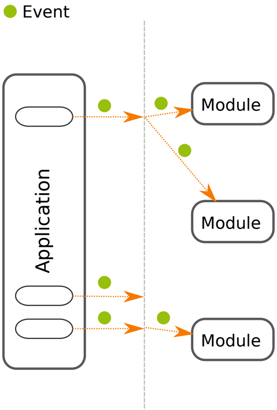

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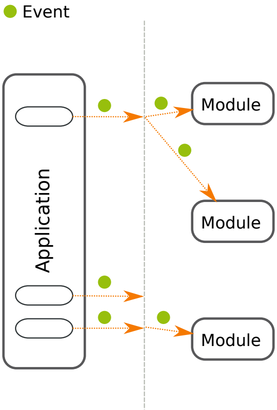

Event handling

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- Events “fired” (by core or module)
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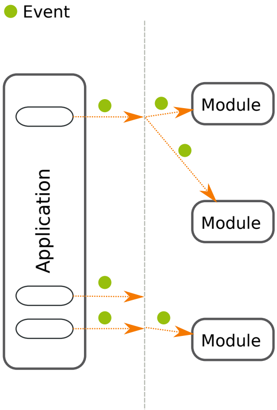
- Maybe including data
- Optionally transparent



Subject-Observer

```php
<?php

class Subject
{
    public function doSomething()
    {
        $this->notify( 'doSomethingStart' );
        // ...
        $this->notify( 'doSomethingEnd' );
    }
}
```

Subject-Observer

```php
<?php

class Subject
{
    protected $observers = array();

    public function addObserver( Observer $observer )
    {
        $this->observers[] = $observer;
    }

    public function notify( $event, $data = null )
    {
        foreach ( $this->observers as $observer )
        {
            $observer->$event( $data );
        }
    }

    public function doSomething()
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class Observer
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        // ...
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  - **Requires implementation in each subject**

Signal slot

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$handler = new SignalSlot();

$handler->register(
    'UserLoggedIn',
    array( new LoginCounterModule(), 'handleUserLoggedIn' )
);
$handler->register(
    'UserLoggedIn',
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$handler->emit(
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  - Signal-Slot handler needs to be injected

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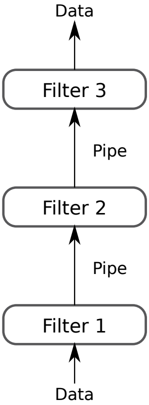
- Approaches
  - Event handling
  - Data handling

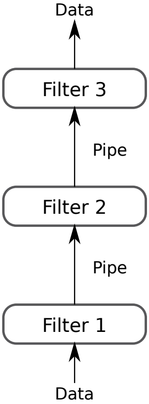
Data handling

- Data processing



Data handling

- Data processing
- Pipes
  - Transport data



Data handling

- Data processing
- Pipes
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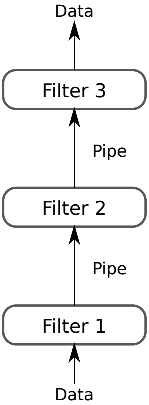
- Filters
  - Manipulate data



Popoon

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<?xml version="1.0"?>

<sitemap xmlns="http://apache.org/cocoon/sitemap/1.0">

<pipelines>

  <pipeline>
    <match type="uri" pattern="examples.tgz">
      <read type="tgz" src="." name="examples.tgz"/>
    </match>
  </pipeline>

  <pipeline >
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  - Somewhat forces linear code flow

Outline

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Approaches

Real world

Summary

Outline

- Real world
  - Hooks
  - Patching
  - Inheritance

Serendipity hook announcement

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// $out is CSS string
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Serendipity hook reaction

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    function event_hook($event, &$bag, &$eventData) {
        switch($event) {
            case 'css':
                if (strpos($eventData, '.bb-code') !== false) {
                    // class exists in CSS ...
                    return true;
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  - Plugin can easily break hook data
  - No defined data formats
  - “Liskov substitution principle” limits what you are allowed to do

Outline

Real world

- Hooks
- Patching
- Inheritance

Patching the source

- The naive approach

Patching the source

- The naive approach
- Works suprisingly well
  - For some of the largest module ecosystems
  - phpBB

phpBB MODx format

```xml
<?xml version="1.0" encoding="utf-8" standalone="yes" ?>
<!-- ... -->
<mod xmlns="http://www.phpbb.com/mods/xml/modx-1.2.0.xsd">
    <header><!-- ... --></header>
    <!-- ... -->
        <open src="index.php">
            <edit>
                <comment lang="en">Here is a comment</comment>
                <comment lang="nl">Hier is een stukje commentaar</comment>
                <find>text to find</find>
                <action type="replace-with">text to be replaced with</action>
            </edit>
            <edit>
                <find>text to find</find>
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- Benefits:
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- Drawbacks:

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  - Complex modules require deep knowledge

Outline

Real world

- Hooks
- Patching
- Inheritance

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  - *How can that be possible?*

Modular inheritance

- `oxnew("ClassName")` instead of `new ClassName`
- Inheritance graph created on-the-fly
- Generates intermediate classes

Example

```php
<?php

class oxArticle
{
    public function calculatePrice()
    {
        // ...
    }
}

class myArticle
    extends oxArticle
{
    // ...
}

class yourArticle
    extends oxArticle
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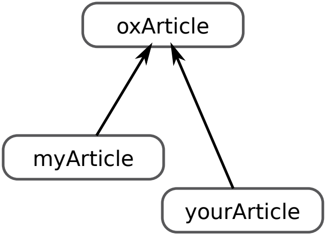

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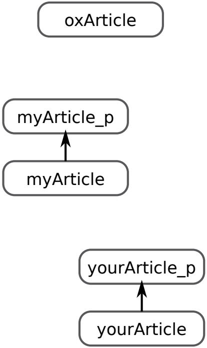

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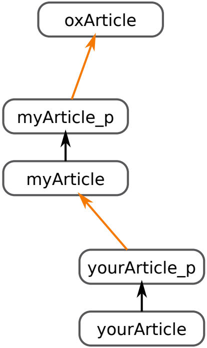

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  - Almost untestable
  - *Everything* becomes public API

Outline

Motivation

Resources

Approaches

Real world

Summary

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- Patching
- Hooks
- Pipes & Filters
- Inheritance
- Subject-Observer
- Signal-Slot

Thanks for Listening

Questions? Comments? Critics? Ideas?

Please rate this talk at
`https://joind.in/6102`

Thanks for Listening

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(Slides will be linked there)

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`http://qafoo.com`