What's Happening in PHP?

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Not your Grandpa's PHP

Sampling of Changes

Full OOP

PHP 5.0 — 2004

Object Oriented Programming

Full OOP Support

Many modern features

```php
class Person {
    public $name;

    public function __construct($name) {
        $this->name = $name;
    }

    public function announcement() {
        return "{$this->name}";
    }
}

class Employee extends Person {
    public $job;

    public function announcement() {
        return parent::announcement . ", " . $this->job;
    }
}
```

SPL (Standard PHP Library)

SPL includes numerous pre-built solutions:

- **Data Structures** (Linked Lists, Stacks, Queues, Heaps, …)
- **Iterators** (w/ Filtering, Caching, Recursion, …)
- **Various standard objects** (FileObject, ArrayObject, …)
- **Subject/Observer Interface**
- **Exceptions**
- and more …

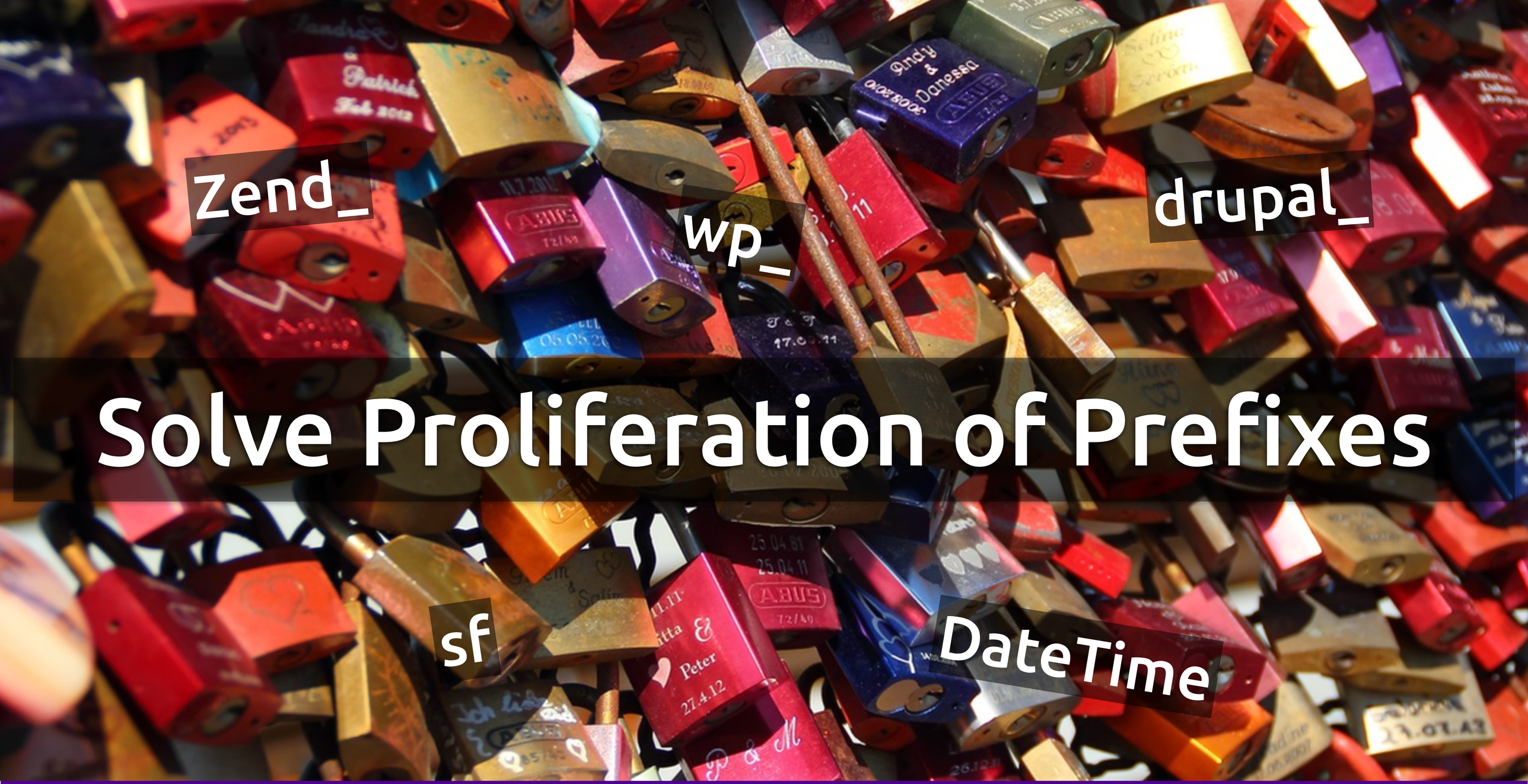
Namespaces

PHP 5.3 — 2009

What are Namespaces?

```
class DateTime {
    private $dt;

    public __construct($input) {
        $this->dt = $input;
    }

    public format() {
        return date("Y-m-d", $this->dt);
    }
}
```

```
class DateTime {
    public static rfc2822($time) {
        return date(DATE_RFC2822, $time);
    }

    public static rss($time) {
        return date(DATE_ATOM, $time);
    }
}
```



Defining Namespaces

Namespaces let you have multiple libraries with identically named classes & functions.

```php
<?php
namespace WorkLibrary;

class Database {
    public static connect() { /* ... */ }
}
```

Define with the **namespace** keyword to include all code that follows.

```php
<?php
namespace MyLibrary;

class Database {
    public static connect() { /* ... */ }
}
```

Sub-namespaces

Use a backslash '\' to create these

```php
<?php
namespace MyLibrary\Model;

class Comments {
    public __construct() { /* ... */ }
}
```

```php
<?php
namespace Treb\Framework\Utility;

class Cache {
    public __construct() { /* ... */ }
}
```

Using Namespaces

Use the fully qualified name

```php
$db = MyProject\Database::connect();
$model = new MyProject\Model\Comments();
```

Import via the **use** keyword

```php
use MyProject\Database;
$db = Database::connect();
```

Alias when importing via **as** keyword

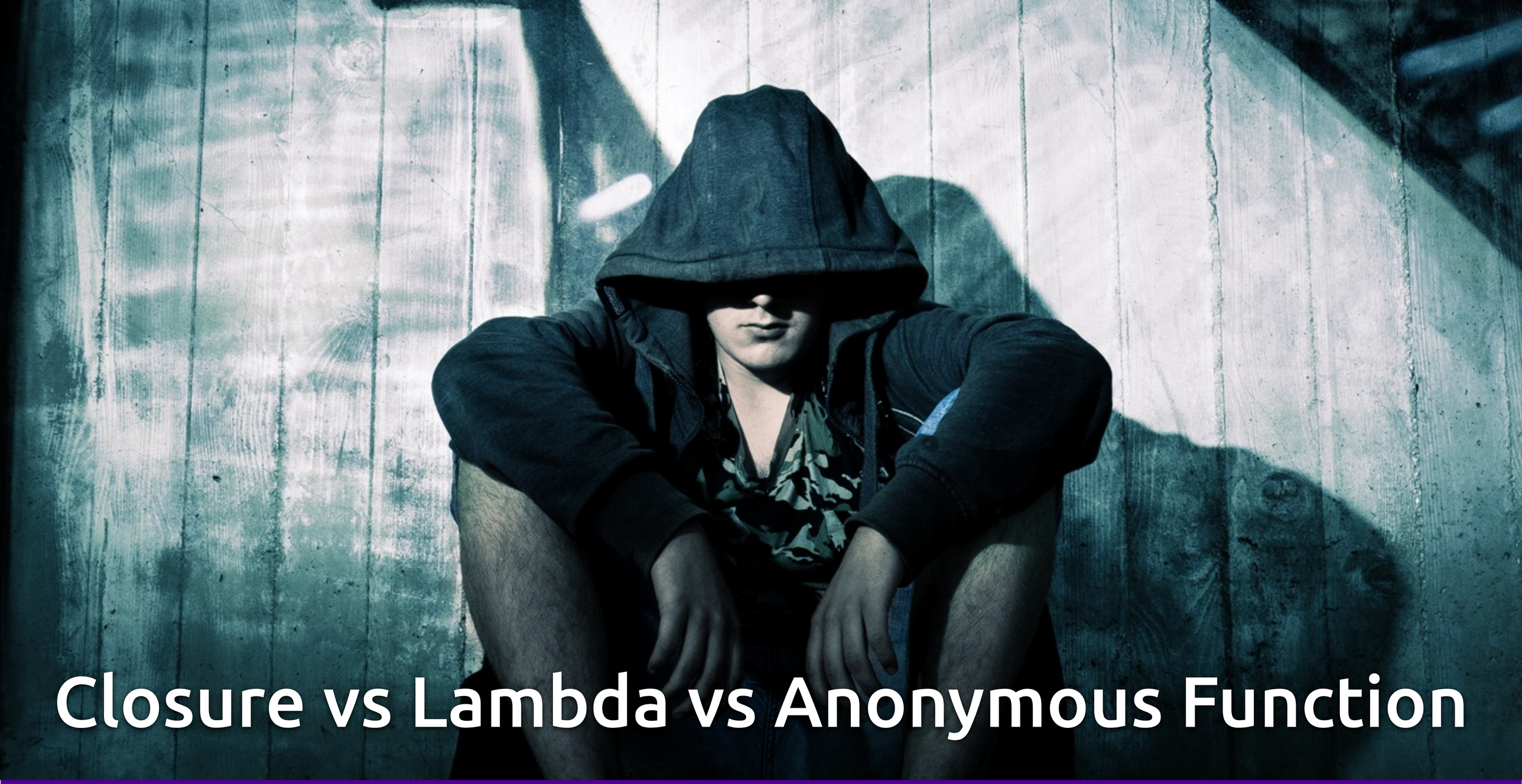
```php
use MyProject\Model\Comments as MyCo;
$model = new MyCo();
```

Reference builtin classes with top level ****

```php
$images = new \DateTime();
```

Closures

PHP 5.3 — 2009



Closure vs Lambda vs Anonymous Function

Creating Anonymous Functions

Declare using **function** & store in variable

```php
$hal = function($what) {
    echo "Opened the {$what}\n";
};
$hal('bay doors'); // Displays: Opened the bay doors
```

Many built-in functions now support them

```php
$turtles = [
    'Leonardo' => ['color' => 'blue'],
    'Raphael' => ['color' => 'red'],
    'Donatello' => ['color' => 'purple'],
    'Michelangelo' => ['color' => 'orange'],
    ];

$color_sort = function($a, $b) {
    return strcmp($a['color'], $b['color']);
};
uasort($turtles, $color_sort);
```

Creating a Closure

PHP defines the keyword **use** for pulling variables into scope

Variables must be explicitly included

```php
$tax = 0.05;
$total = 0;
$cart = ['book' => 9.99, 'toy' => 4.95, 'milk' => 2.50];

$add = function($amount) use ($tax, &$total) {
    $total += $amount + $amount * $tax;
};

foreach ($cart as $price) {
    $add($price);
}

setlocale(LC_MONETARY, 'en_US');
echo money_format('%n', $total), "\n";
// Displays $18.31
```

Traits

PHP 5.4 — 2012

Traits

Enable horizontal code reuse

Create code and inject it into different classes

Contains actual implementation

```php
// Define a simple, albeit silly, trait.
trait Counter
{
    protected $_counter;

    public function increment() {
        ++$this->_counter;
    }

    public function decrement() {
        --$this->_counter;
    }

    public function getCount() {
        return $this->_counter;
    }
}
```

Using Traits

Inject into a class with the **use** keyword

A class can include multiple **traits**

```php
class MyCounter
{
    use Counter;

    /* ... */
}

$counter = new MyCounter();
$counter->increment();
echo $counter->getCount(); // 1
```

OpCache

PHP 5.5 - 2013

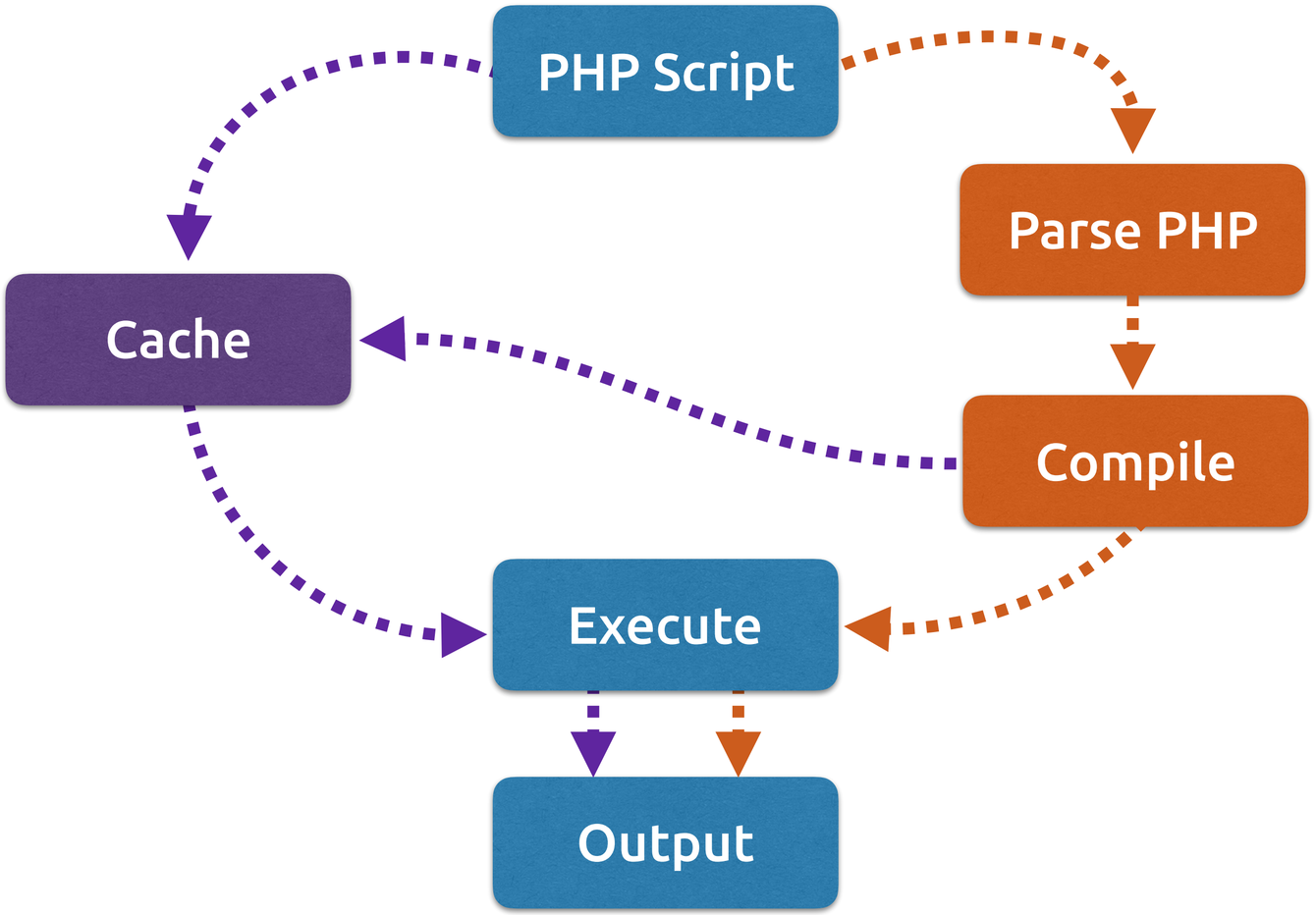
Now Built In

Opcode caching has existed for a while

Good performance *(~1.7x)*

Was a separate install, often ignored

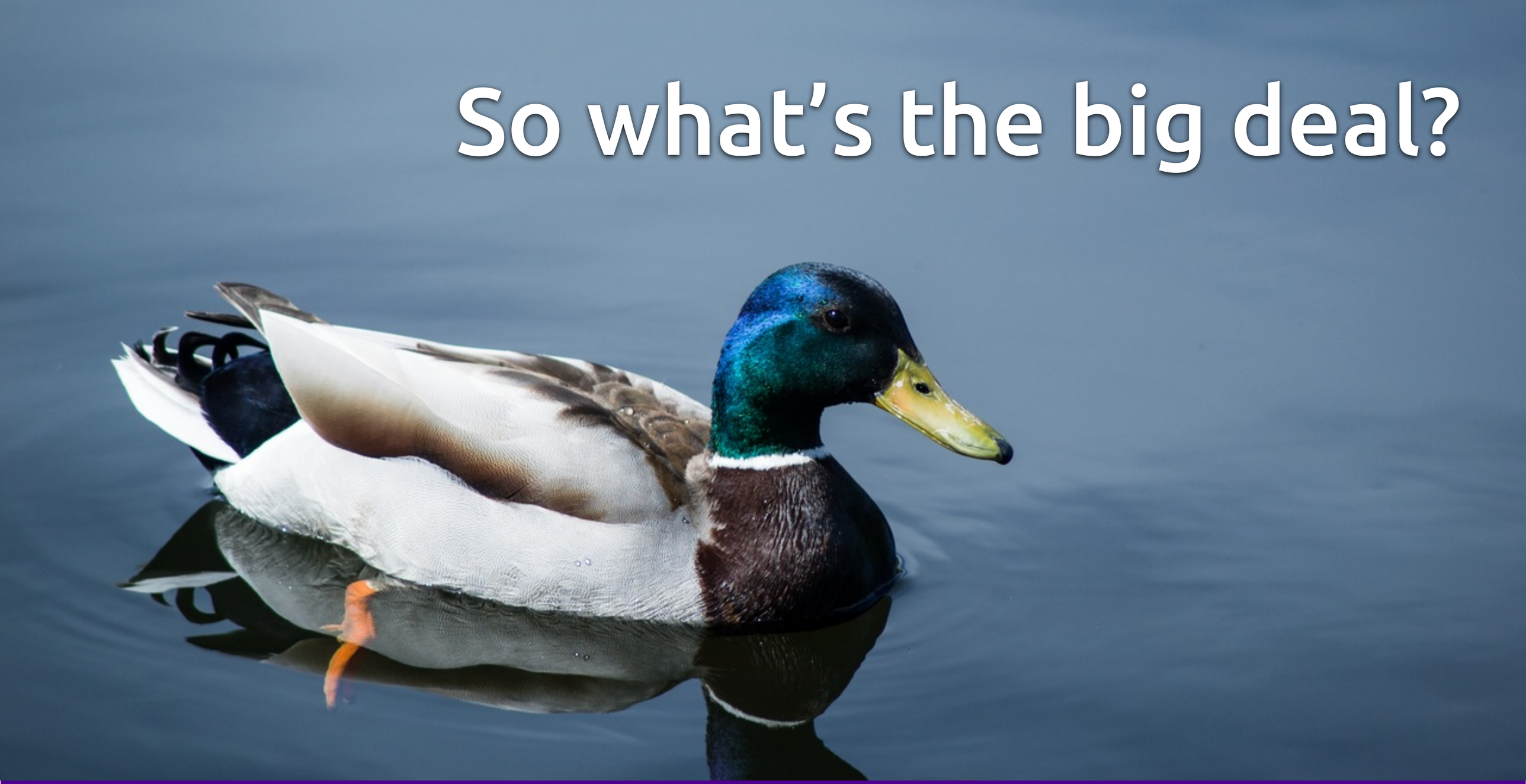
Now always there



Strict Typing

PHP 7.0 — 2015

So what's the big deal?



Object & Array Hints

Declare object names on parameters

Also could require an array

PHP 5: Fatal error

PHP 7: TypeError exception

```php
function access(DateTime $time, PDO $db, User $user) {
    $stmt = $db->prepare(
        "UPDATE login
         SET lastAccess = ?
         WHERE uid = ?");
    $stmt->execute([
        $time->format("Y-m-d H:i:s"), $user->uid]);
}
```

```php
function array_mult(array $in) {
    $result = 1;
    foreach ($in as $value) {
        $result *= $value;
    }
    return $result;
}
```

Scalar Hints

PHP 7 Added:
bool
float
int
string

```php
function greeting(string $name, bool $boss = false) {
    if ($boss) {
        return "Good to see you {$name}\n";
    } else {
        return "Hey there {$name}\n";
    }
}
echo greeting("Milhouse");
```

But how should PHP handle a mismatch given duck-typing?

```php
function sum(int $x, int $y) {
    return $x + $y;
}

echo sum(3, 4);
echo sum(2.5, 4.5); // Returns, what?
```

Best of Both Worlds

Default result is forced conversion via duck-typing

```php
<?php
function sum(int $x, int $y) {
    return $x + $y;
}

echo sum(2.5, 4.5); // Returns 6
```

Strict typing can be turned on per file, causing exceptions

```php
<?php
declare(strict_types=1);

function sum(int $x, int $y) {
    return $x + $y;
}

echo sum(2.5, "4"); // Throws TypeError exception
```

Allows Programmer Decision

Since it operates on a per file basis. You are always in charge of whether you want strict or loose typing.

Decisions made by library authors don't effect you.

Return Types Too

You can declare return types as well

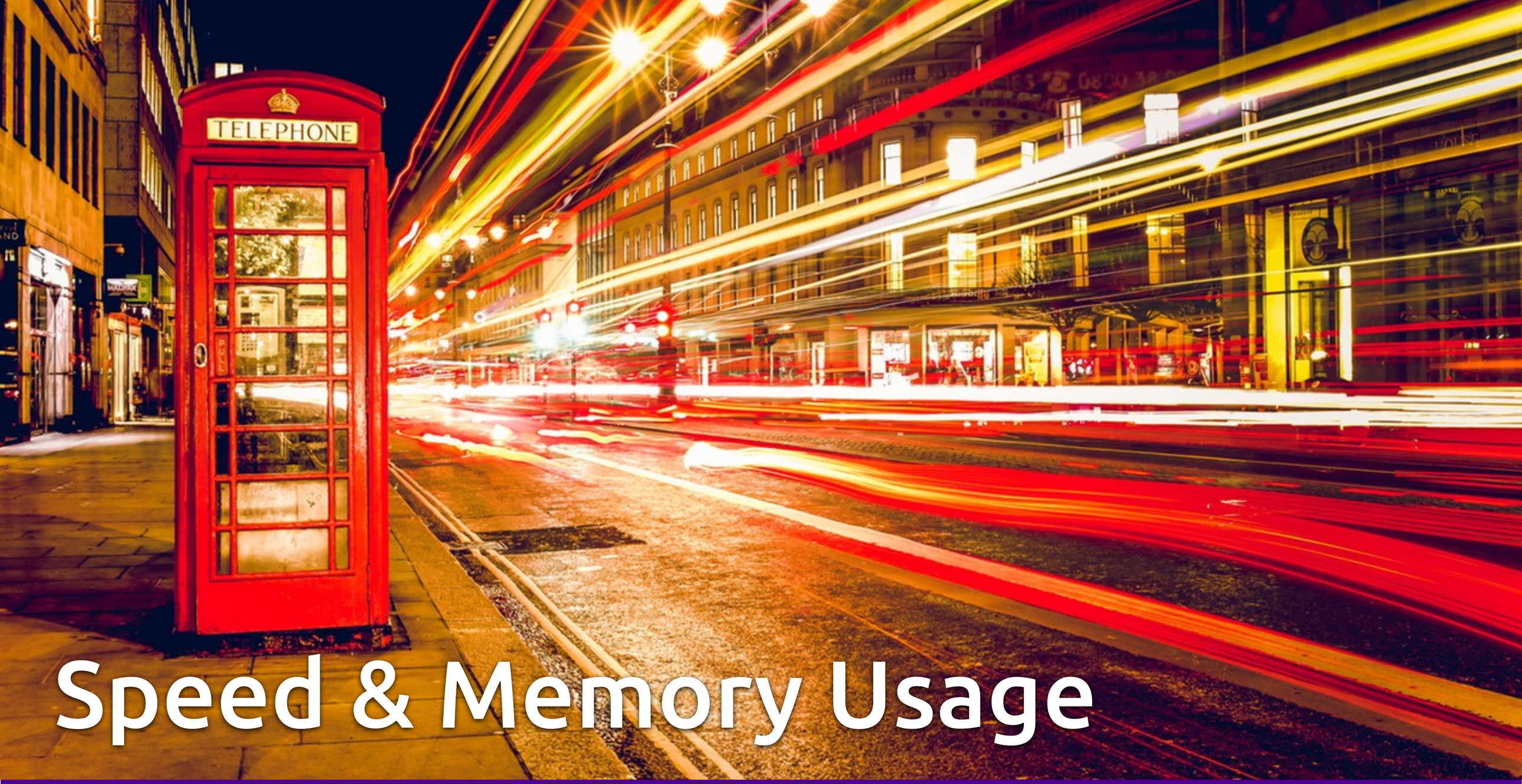
```php
function sum(int $x, int $y): int {
    return $x + $y;
}

function go(): array {
    return [ 'Instinct' => 'yellow',
             'Mystic' => 'blue',
             'Valor' => 'red' ];
}
```

PHP 7.1 added nullable types (?)

```php
function connect(string $dsn): ?PDO {
    try {
        $db = new PDO($dsn);
        return $db;
    } catch (PDOException $e) {
        return null;
    }
}
```

Zend Engine 3

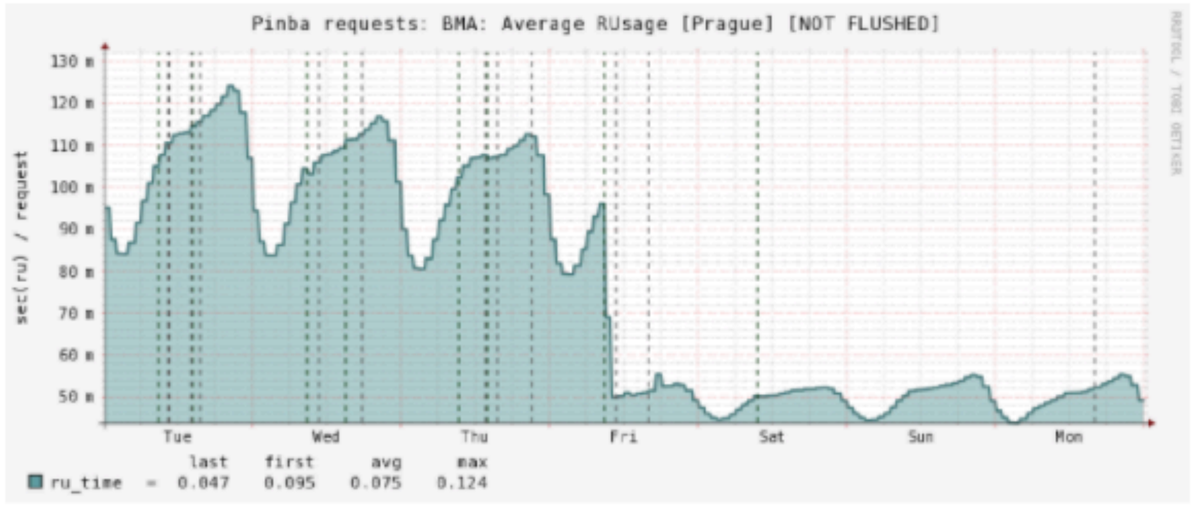
PHP 7.0 — 2015



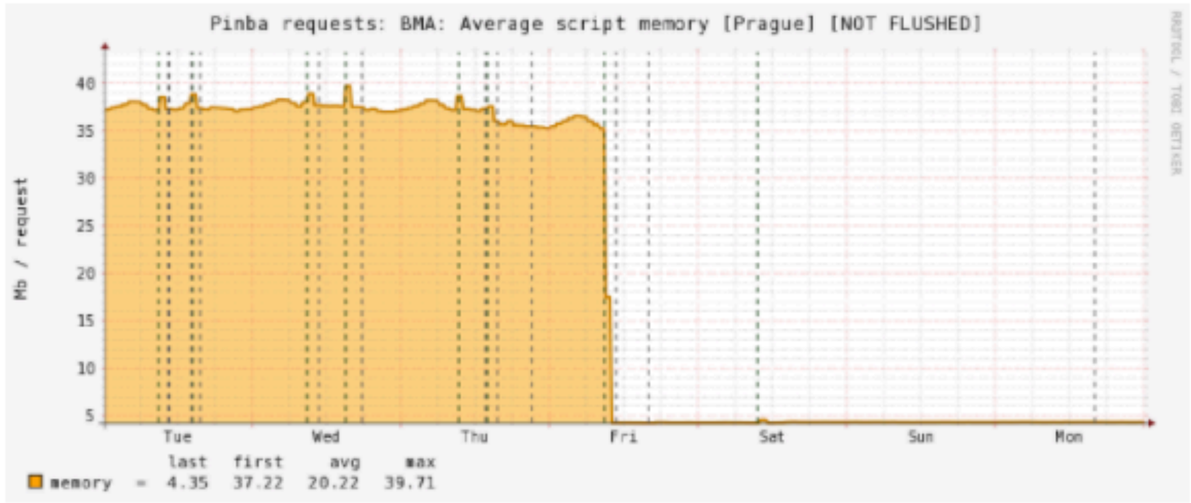
Speed & Memory Usage

Stats from Badoo upgrading to PHP 7

RUsage (CPU time):



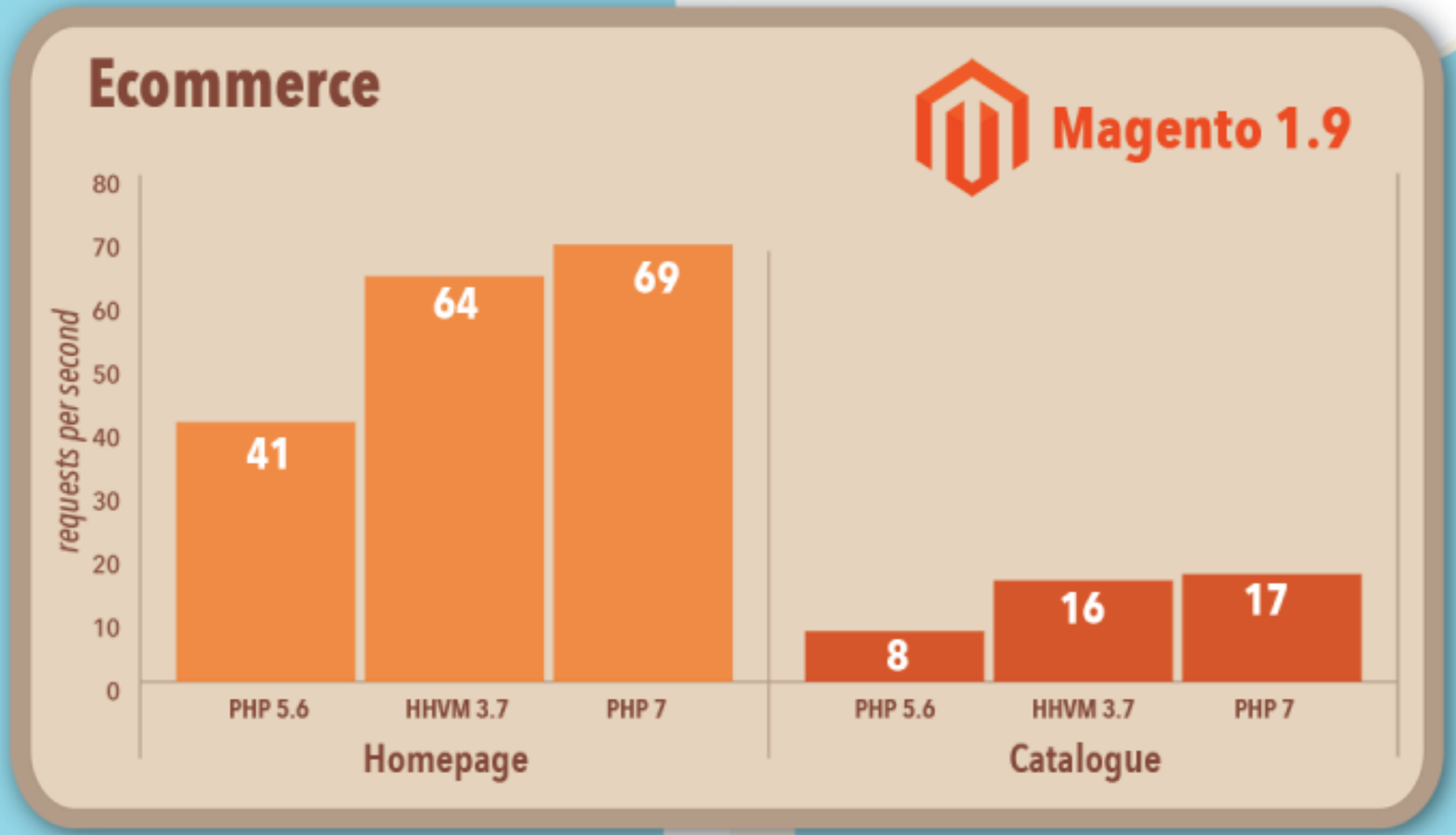
Memory usage:



Source: Badoo Tech Blog

Run up to 3x Magento transactions on the same hardware

With execution time more than twice as fast compared to PHP 5.6 and 30% lower memory consumption - servers running PHP 7 will be able to serve up to 3x as many requests as those running PHP 5.6.



Source: Zend Technologies

Outside of Core

Built by Community

PHP-FIG

Community Standards

History of PHP-FIG

Started organically at php[tek] 2009
5 people originally

Goal: Make PHP frameworks work together more easily

Has grown since then, ~40 members now

Numerous Standards

PSR-0 & PSR-4: Autoloading
PSR-1 & PSR-2: Coding Style
PSR-3: Logging Interface
PSR-6: Caching Interface
PSR-7: HTTP Message Interface
PSR-13: Hypermedia Links

Composer

Ecosystem innovation

Dependency Manager for PHP

Allows complex systems to be built effortlessly

Adopted by most major frameworks: Symfony, Laravel, Drupal & more

Handles autoloading classes for you

getcomposer.org

JSON Configuration

Specify minimum PHP version

List of packages & versions

Options such as autoload, dev tools…

```
{
    "require": {
        "php": ">=5.6.0",
        "phergie/phergie-irc-client-react": "~3.1",
        "phergie/phergie-irc-connection": "~2.0",
        "phergie/phergie-irc-event": "~1.0",
        "evenement/evenement": "~2.0",
        "monolog/monolog": "~1.6"
    },
    "require-dev": {
        "phergie/phergie-irc-bot-react-development": "~1.0"
    },
    "autoload": {
        "psr-4": {
            "Phergie\\Irc\\Bot\\React\\": "src"
        }
    }
}
```

`composer up`

Fetches all dependancies and installs them

```
windlass-3:/Users/eli/Projects/ps> composer up
Loading composer repositories with package information
Updating dependencies (including require-dev)
Package operations: 9 installs, 0 updates, 0 removals
  - Installing guzzlehttp/promises (1.3.0)
    Downloading: 100%

  - Installing psr/http-message (1.0.1)
    Downloading: 100%

  - Installing guzzlehttp/psr7 (1.3.1)
    Downloading: 100%

  - Installing guzzlehttp/guzzle (6.2.2)
    Downloading: 100%

  - Installing symfony/polyfill-mbstring (v1.3.0)
    Downloading: 100%

  - Installing symfony/dom-crawler (v3.2.0)
    Downloading: 100%

  - Installing symfony/css-selector (v3.2.0)
    Downloading: 100%

  - Installing symfony/browser-kit (v3.2.0)
    Downloading: 100%

  - Installing fabpot/goutte (v3.2.0)
    Downloading: 100%

symfony/browser-kit suggests installing symfony/process ()
Writing lock file
Generating autoload files
```

Package Repository

Community run main repository

Packages actually live elsewhere

Can be loaded via Git, SVN, Zip file, …

packagist.org

Same JSON File

Add descriptors to composer.json

Config becomes usable package

Submit to Packagist

```
{
    "name": "laravel/framework",
    "description": "The Laravel Framework.",
    "keywords": ["framework", "laravel"],
    "license": "MIT",
    "homepage": "https://laravel.com",
    "support": {
        "issues": "https://github.com/laravel/framework/issues",
        "source": "https://github.com/laravel/framework"
    },
    "authors": [
        {
            "name": "Taylor Otwell",
            "email": "taylor@laravel.com"
        }
    ],
    "require": {
        "php": ">=5.6.4",
        "ext-mbstring": "*",
        "ext-openssl": "*",
        "classpreloader/classpreloader": "~3.0",
        "doctrine/inflector": "~1.0",
        "jeremeamia/superclosure": "~2.2",
```

Smaller Stuff

Late static binding

Goto support

Short array syntax

Built in Web Server

finally{}

Generators

Variadic functions

Constant scalar expressions

Null coalescing operator (??)

UFO operator (<=>)

Secure password hashing

Pardon a brief commercial interruption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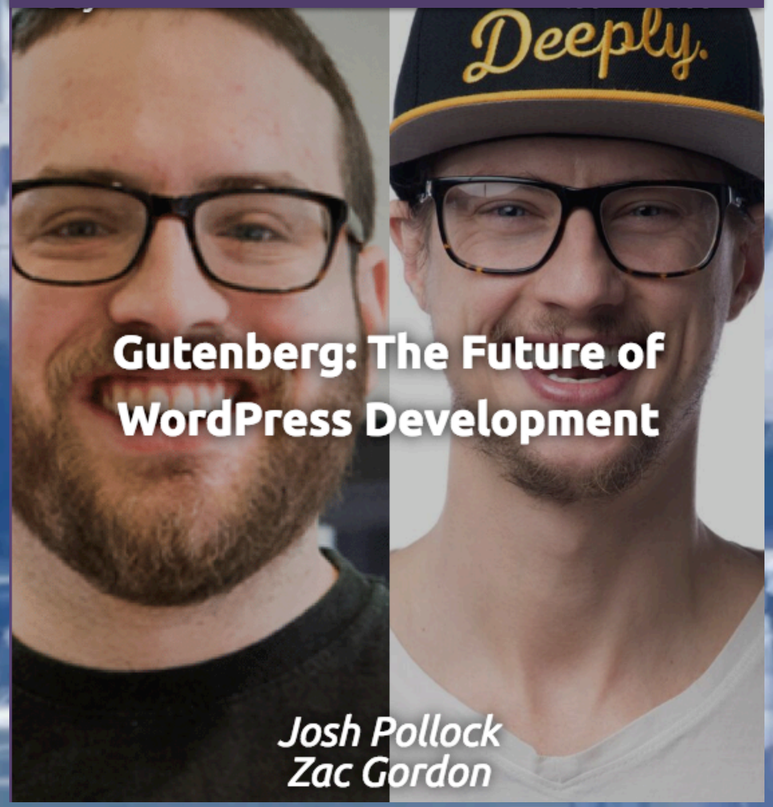

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