

Things to consider for testable code

Frank Kleine, 12.09.2009



The Speaker: Frank Kleine

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Separation of Concerns

- Typical concerns in applications



A background image of a chalkboard filled with a complex, hand-drawn flowchart in white chalk. The flowchart consists of numerous rectangular process boxes, diamond-shaped decision boxes, and circular start/end symbols, all interconnected by arrows indicating the flow of a business process. The drawing is somewhat messy and illustrative, typical of a whiteboard sketch.

Business logic

Ef@q#IT/htm?JqmbJ]kPcN/M!":-m@oFLL<7]mST4/T13Cn>3-HZDW+;;\iqNHMPM]094Ef@q#IT/htm?JqmbJ]kPcN/M!":-m@oFLL<7]mST4/T13Cn>3-HZDW+;;\iqNHMPM]094
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Error handling



Environment handling



Didn't we forget something really important?



Construction of Objects!



Construction of objects

- new is a very powerful keyword
- Binds usage to a concrete implementation
- Golden rule of new:
 - OK for domain classes, but not for services
 - OK in tests and specialised construction classes, but not in business logic



Construction of objects II

- **Bad:**

Hard to test

Work in
constructor
(Anti-Pattern)

```
class Car {  
    public function __construct() {  
        $this->engine = new Engine();  
        $this->tire    = TireFactory::createTire();  
    }  
}
```

Piece of
cake to test

- **Good:**

```
class Car {  
    public function __construct(Engine $eng, Tire $tire) {  
        $this->engine = $eng;  
        $this->tire    = $tire;  
    }  
}
```

Dependency
Injection



Dependency Injection

- Pile of new (startup phase)
 - Create objects and stack them together
 - "Boilerplate", but automatable with DI framework
- Pile of objects (runtime phase)
 - Business logic, error handling, etc.
- Factories or DI instances for runtime object creation



Law of Demeter

- **Bad:**

```
class Driver {  
    public function drive($miles) {  
        $this->vehicle->engine->  
        $this->vehicle->drive(  
        $this->vehicle->engine-  
    }  
}
```

Driver
coupled to
Engine

Hard to test: test
always needs
Engine or a mock
of it

Internal state
of Car
revealed

- **Good:**

```
class Driver {  
    public function drive($miles) {  
        $this->vehicle->start();  
        $this->vehicle->drive($miles);  
        $this->vehicle->stop();  
    }  
}
```

Piece of
cake to test

Driver not coupled
to Engine: simpler
to maintain

Less prone
to errors



Global state

- Same operation with same inputs should yield same results.
- Not necessarily true with global state.
- Hidden global state
 - Singleton
 - static methods
 - \$_GET, \$_POST, \$_SESSION, \$_...
 - Registry



Global state: Singletons

- Never implement any
- Required most likely due to bad design of your framework
- Use a DI framework with support for Singleton scope
 - Gives full power of Singletons
 - Code using the Singleton stays simple



Singleton with DI

```
$binder->bind('Session')  
->to('PhpSession')  
->in(stubBindingScopes::$SINGLETON);
```

Configure
the binding

Enforce
singletoness: DI
framework will only
create one instance
of PhpSession and
inject always this
same instance

```
class Processor {  
    protected $session;  
    /**  
     * @Inject  
     */  
    public function __construct(Session $session) {  
        $this->session = $session;  
    }  
    ...  
}
```

Tell DI framework
to inject required
parameters on
creation of
Processor

Dependency
Injection

Piece of cake to
test:
independent of
PhpSession



Global state: `static` methods

- Not always bad
 - Simple operations without dependencies
- Always bad if state is involved
 - Might return different results with same input.



Global state: \$_GET, \$_POST, ...

- Ugly to test
- Rule: never access those vars directly in business logic
- Abstract access to globals with classes
 - Remember: Singleton is evil
- Even better: interfaces
- Security: use a Request class which enforces filtering/validating input



Global state: Registry

- Using a DI framework: no registry required
- Without DI framework: use Registry for config values only
- Did I already mentioned that Singletons are evil?
 - static methods are enough



Finally...

- If you remember only one little thing of this presentation it should be...





Singletons are really, really
(and I mean really)

DANGER

EXTREMELY FLAMMABLE
INHALATION OF SPRAY MAY BE HARMFUL
CONTAINER MAY EXPLODE IF HEATED

The End

- Questions and comments?
- Thank you.



Commercial break

- Stephan Schmidt: PHP Design Patterns



- Stubbles: www.stubbles.net

