Dependency Injection Containers and Caching

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Dependency Injection

Passing responsibility of object for initialization of dependent objects.

```php
class DependentClass {

    private $object;

    public __construct(Object $object) {
        $this->object = $object;
    }

}
```

```php
class DependentClass {

    private $object;

    public __construct() {
        $this->object = new Object();
    }

}
```

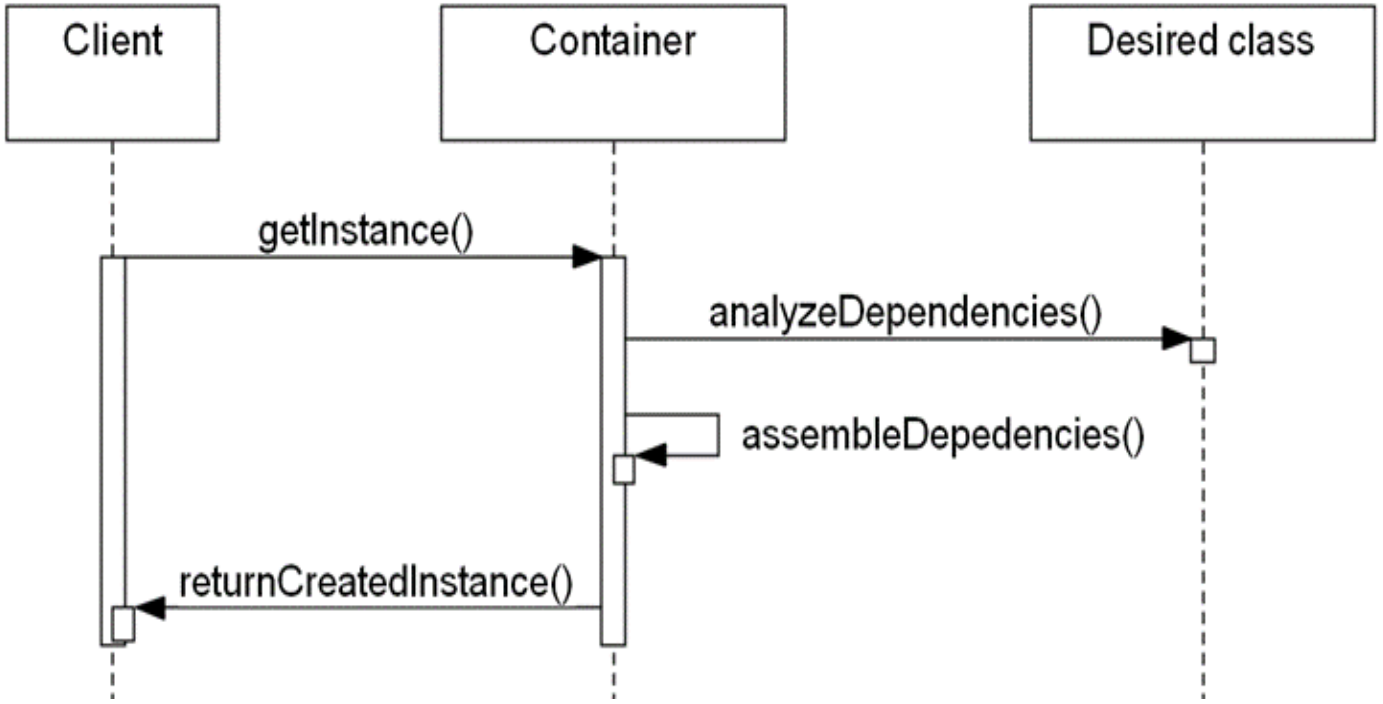
DI Containers Generally

- It facilitates object initializations.
- Increasing popularity of dependency injection.
- They becomes a core part of bigger frameworks and projects (e.g. Symfony, Spring and others).

Examples:

Pimple, PHP-DI, Google Guice.

DI Container Sequential Diagram



Features of DI Containers

- Recursive dependency injection,
- autowiring,
- responsibility for application configuration,
- lazy initialization of objects,
- substitution for some design patterns.

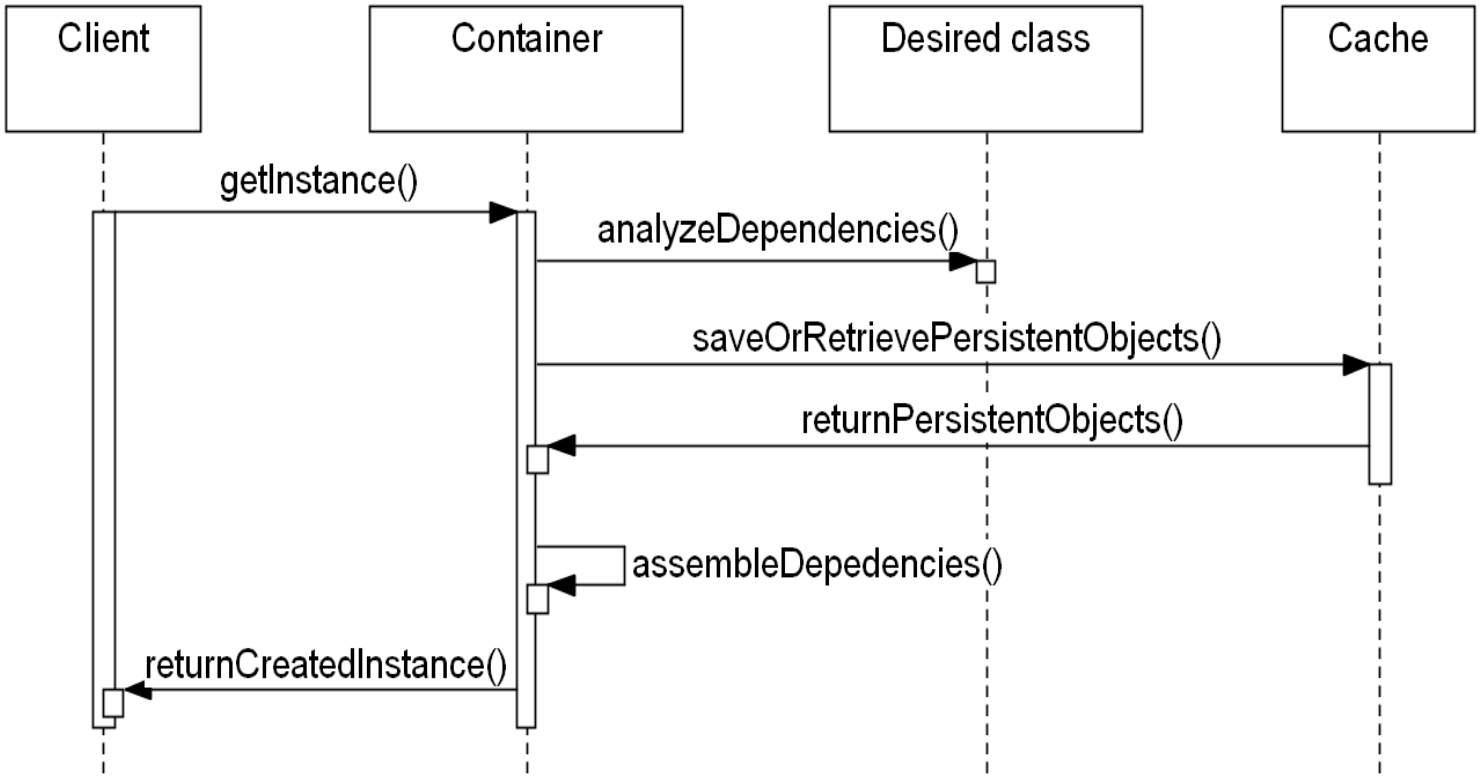
Cache – basic example

```
if (cache_key_exists(Object::class)) {
    $object = cache_fetch(Object::class)
} else {
    $object = new Object();
    cache_store(Object::class, $object)
}
```

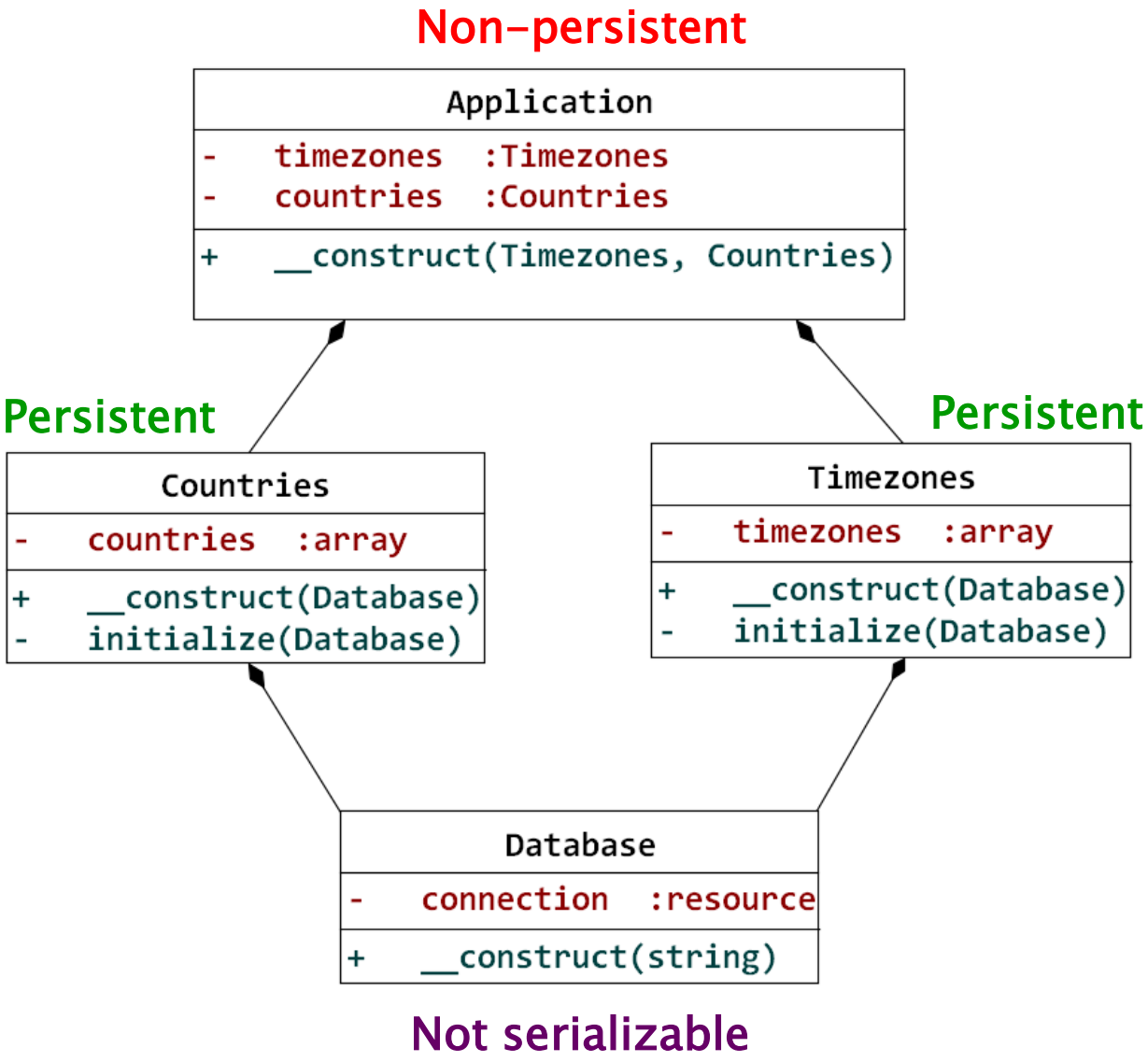
General idea

Let the container fully control lifecycle of class instances regardless the way how they are initialized.

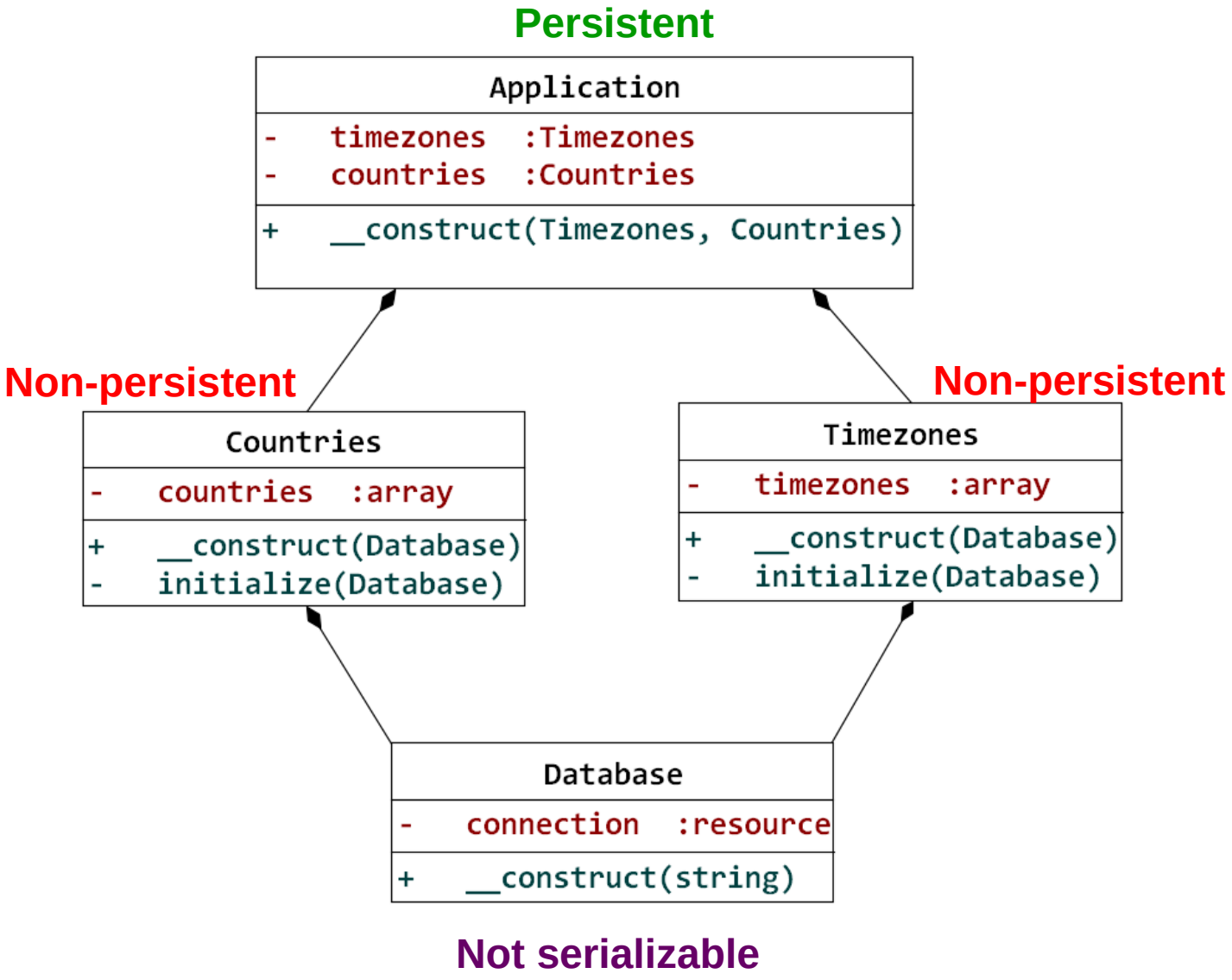
Sequence Diagram of Concept



Initialization process



Initialization process



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Discussion

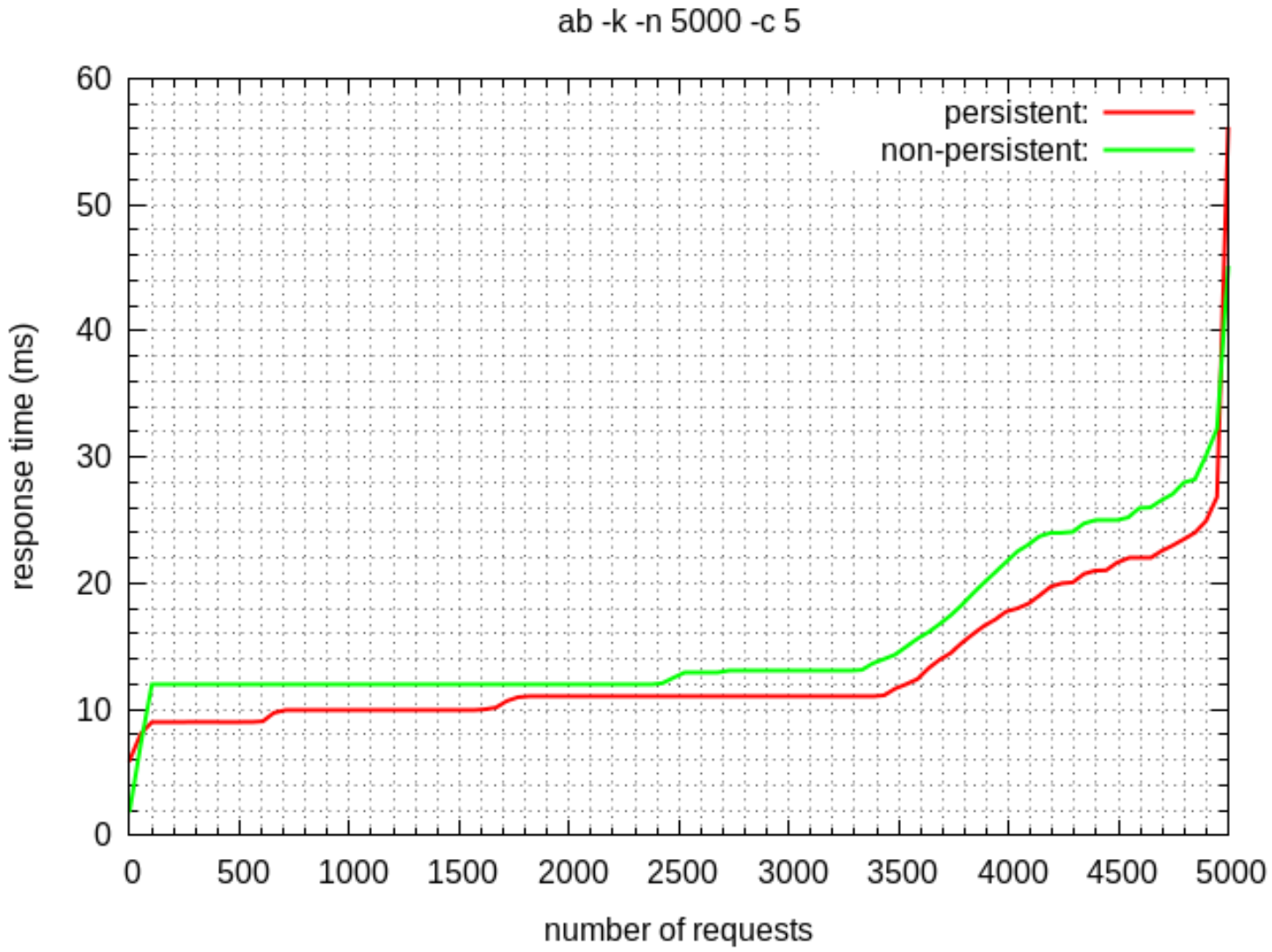
Advantages:

+ Caching of objects is not directly functional part of a class.
+ Improves reusability and testability of classes.
+ Application does not have to be fully initialized with every incoming request.

Disadvantages:

- Persistent class must not contain static and non-serializable class members.
- Developer has to be aware of application architecture, respectively class composition.

Experiment



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Experiment

	Non-persistent container	Persistent container
Time taken for tests	15.586 seconds	13.050 seconds
Complete requests	5 000	5 000
Failed request	55 (invalid length)	0
Request per second	320.81	383.15
Time per request (mean)	3.117 milliseconds	2.610 milliseconds
Percentage of the requests served within a certain time (ms)	50 % 13 66 % 13 75 % 18 80 % 22 90 % 25 95 % 27 98 % 30 99 % 32 100 % 45 (longest time)	50 % 11 66 % 11 75 % 15 80 % 18 90 % 22 95 % 23 98 % 25 99 % 27 100 % 56 (longest time)

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Summary

- ✓ By passing responsibility of object for construction, testability of classes is improved (mocking objects).
- ✓ Lifecycle of instances is controlled by container, hence initialization and configuration is not up to responsibility of classes.
- ✓ By following principles of DI it makes novice developers team more competitive.

Thank you for your attention.

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