Cloud Native Configuration

More than just the environment

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Objective / Agenda

01 Configuration ?

02 Classic approaches

03 Cloud native approaches

04 Demo

WHOAMI

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Cloud Native Developer

Cloud Native Developer

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1. Configuration ?

Configuration

In an applicative context

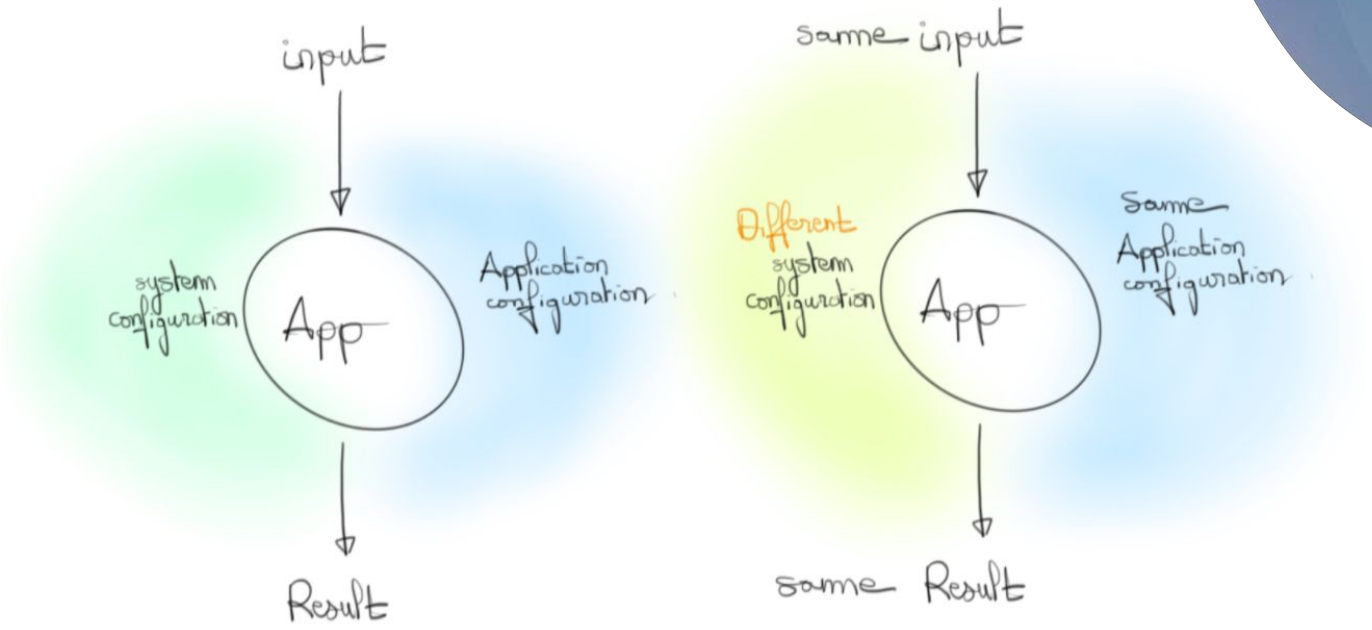
Everything that is likely to vary between deploys

- Tells how the application behaves → Application configuration under our control
  - third party services location
  - identifiers
  - algorithm configurations
  - ...

- Tells how the application is called → Set by the host system environment. Not under our control.
  - IP address
  - Port

Configuration and idempotency

A pillar of the Cloud Native



Configuration in the Cloud Native context

Issues to tackle

How to guarantee idempotency in the cloud ?

Problematics:

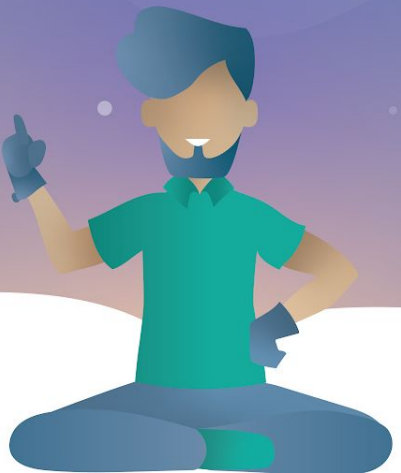
- Massively distributed
- Infinite horizontal scalability
- Ephemeral environments (update and failures are constant)

Target:

→ an automatic deployed configuration for each instance according to the the targeted environment

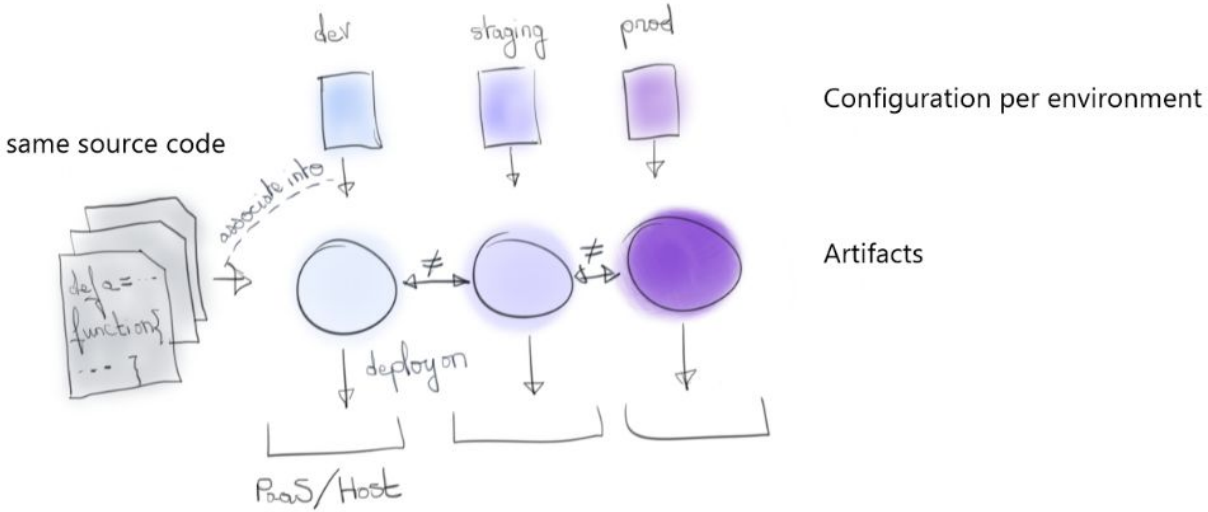
2. Classical approaches

Limitations



Code and configuration are packaged together

Configuration is embedded with the applicative code



Code and configuration are packaged together

Pros and cons

- **Simple approach**
- **Central model for how to configure an application**

- **Artifact is not immutable**
- **An artifact per environment**

Twelve factor App

The third factor

"Store the config in the environment"

- **Environment variables are ubiquitous**
- **Standard for most languages**
- **unique artifact per environments**

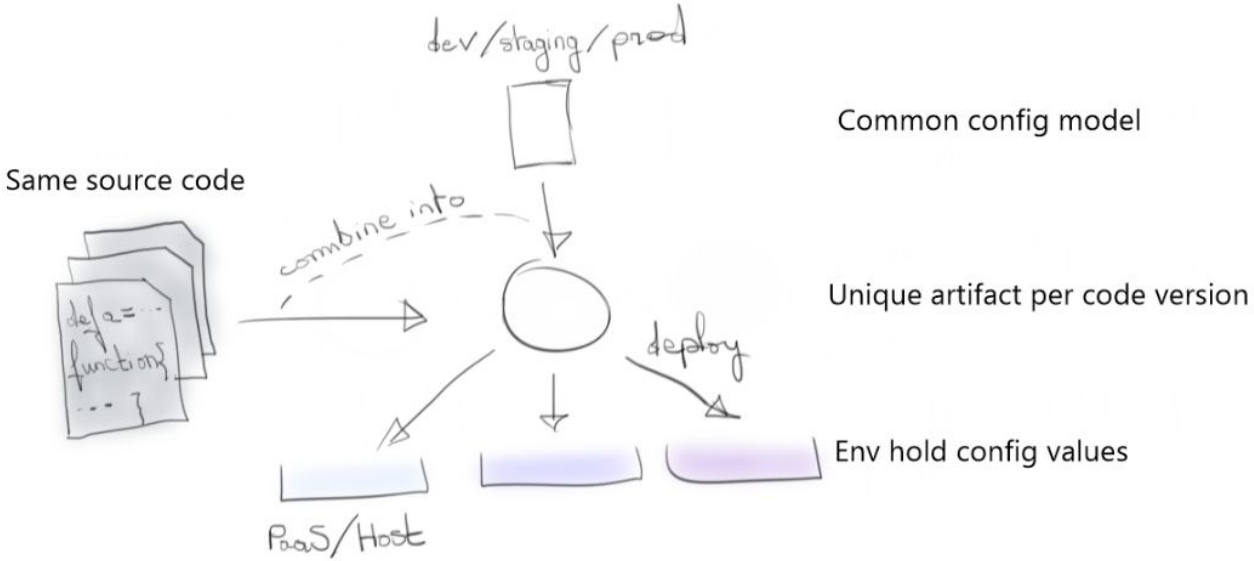
- **What configuration are we talking about ?**
- **getEnv calls spread all over your code**
- **No central model of your configuration**

3. The Cloud Native approach

The “configuration Layer”

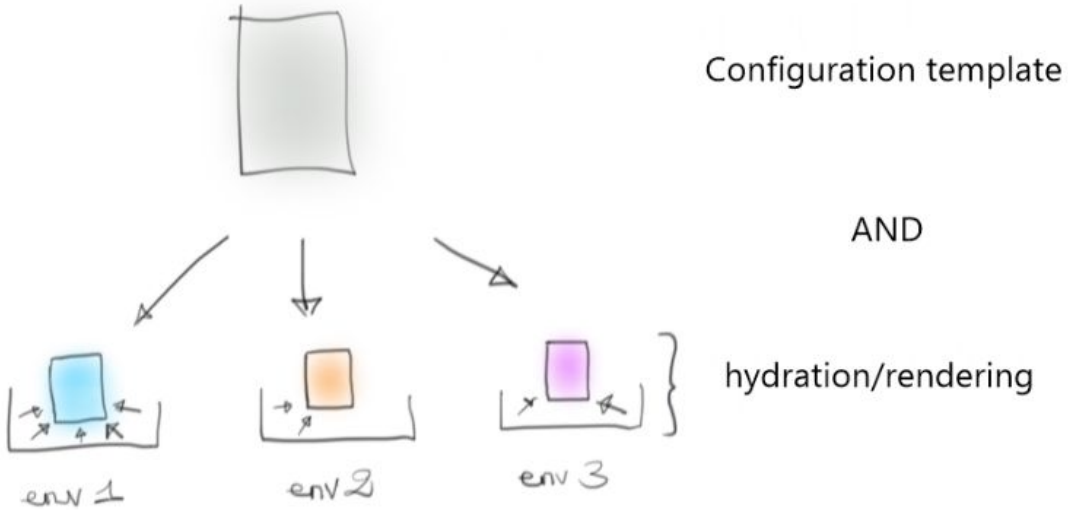
The Configuration Layer
What concepts?

Move a single artifact between environments



The Configuration Layer
Absorbing the context

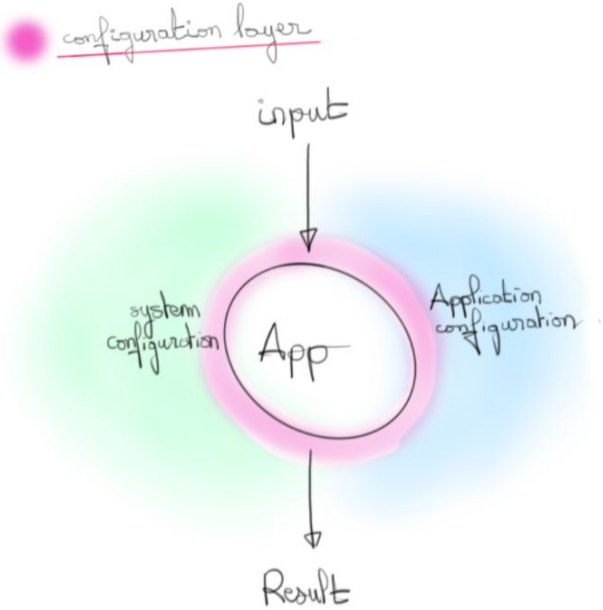
The common model act like a sponge and “absorbs” values from the environment

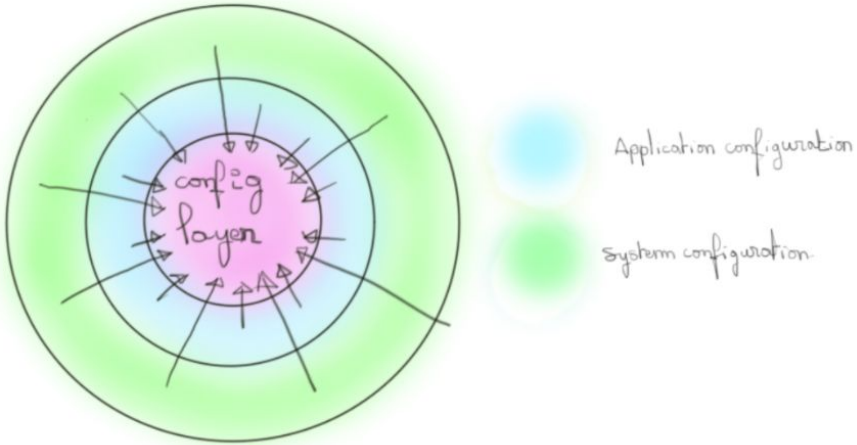


The Configuration Layer

The best of the two worlds

A single source of truth that abstract different origins





The Configuration Layer

Implementation

In the real life

- Not a particular technology but an association of libraries and patterns
- Different level of maturity depending on ecosystem (Jvm, Php, Java, DotNet)
- Conceptual but will demand more or less work considering the chosen ecosystem

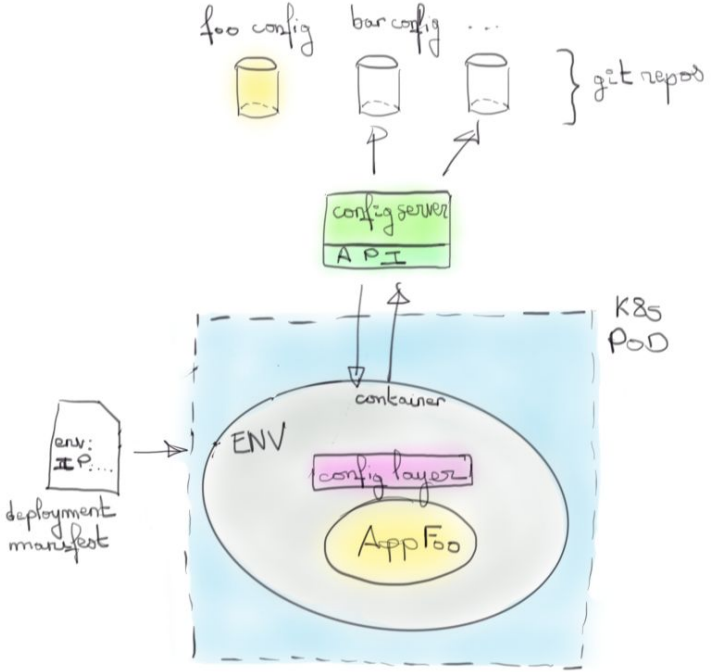
4. In practise

What do we have ?

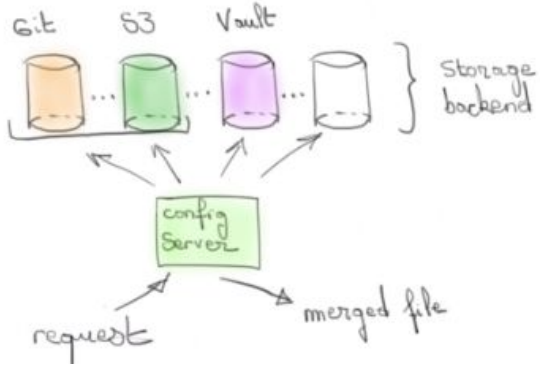
Source the configuration

Spring ecosystem example

K8S + Spring Cloud Configuration



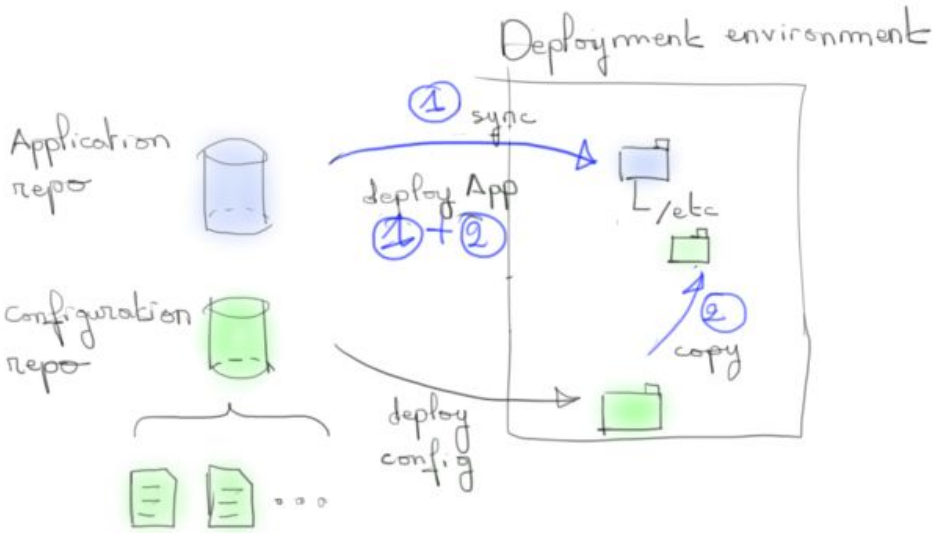
A zoom on Spring Cloud Configuration



With a client (1)

Historical choices, we move step by step

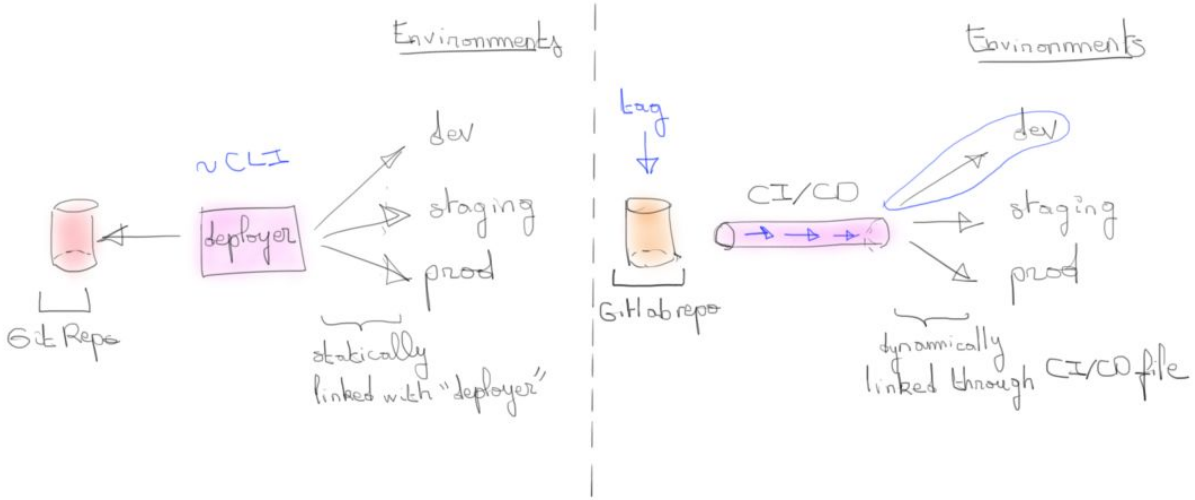
Starting situation



With a client (2)

First step, CI/CD with configuration layer inside the pipeline

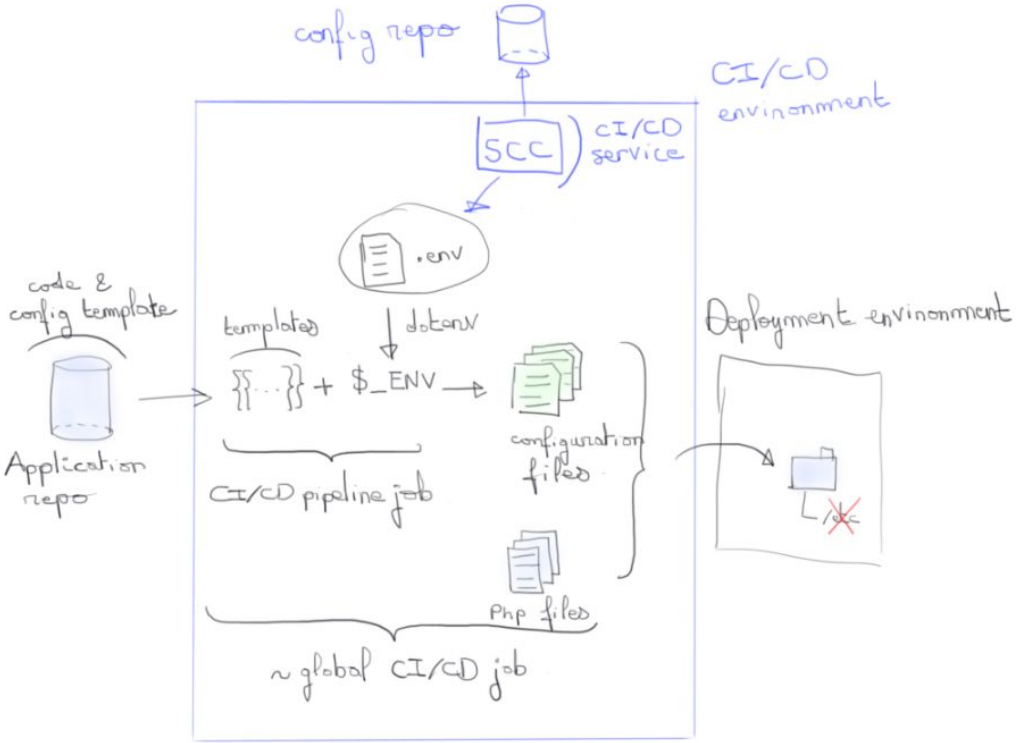
Intermediate situation



With a client (2b)

The configuration layer inside the pipeline environment

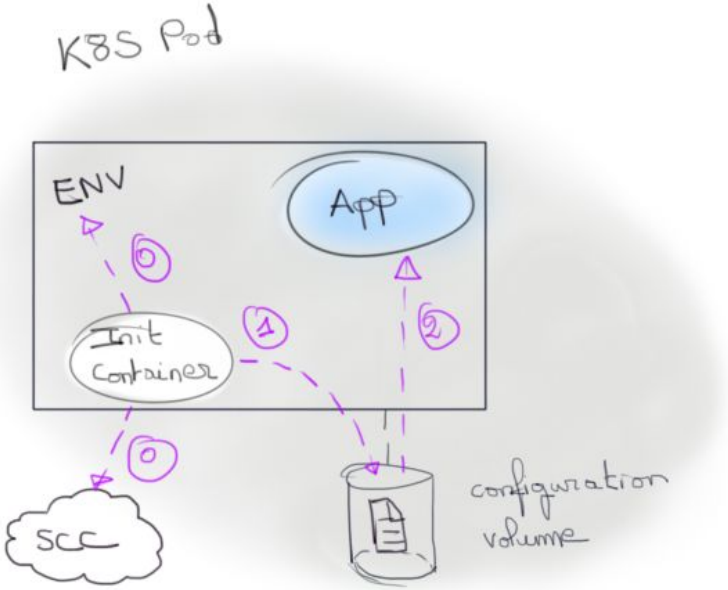
Details



With a client (3)

Translation into the Kubernetes paradigm

Finally



The Lightbend config case

The Rolls Royce of Cloud Native configuration

Human readable, yet flexible for the cloud

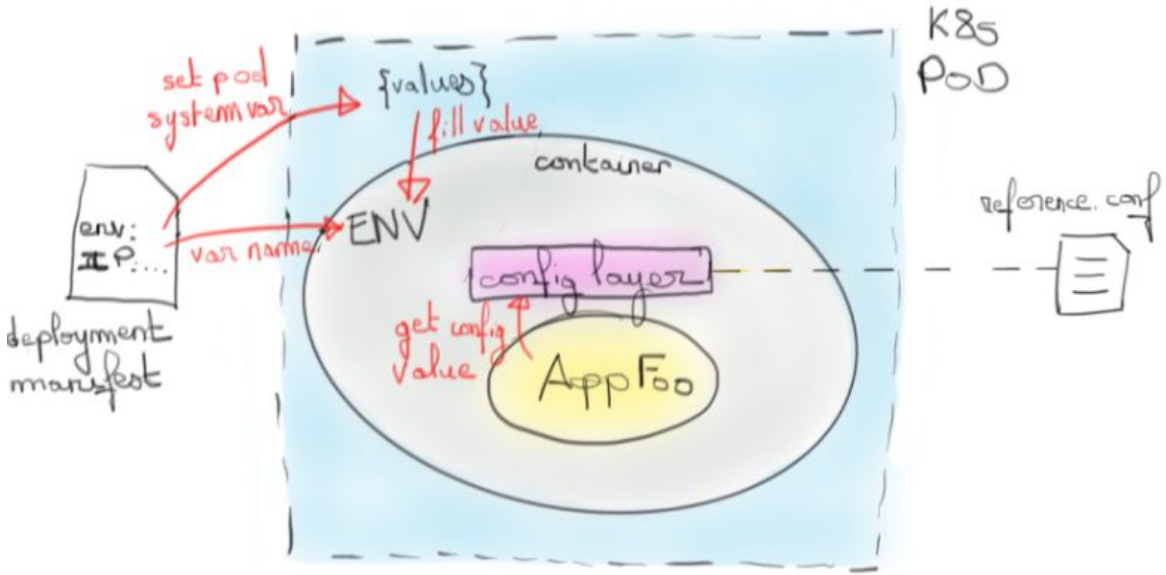
- HOCON format: JSON related, ease of read
  - Order matters
  - Unit for temporal measures (write “30s” instead of “30000”)
  - Typed (String, Duration, Number, Array, ConfigObject, etc.)
- Understands references
  - to variables defined in HOCON files
  - to environment variables
- Merges *.conf file with “system properties” from the JVM
- Handles *include*
- Standard orchestration of loading/merging

Properties allowing creation of a multi-layers configuration!

The Lightbend config case

The Rolls Royce of Cloud Native configuration

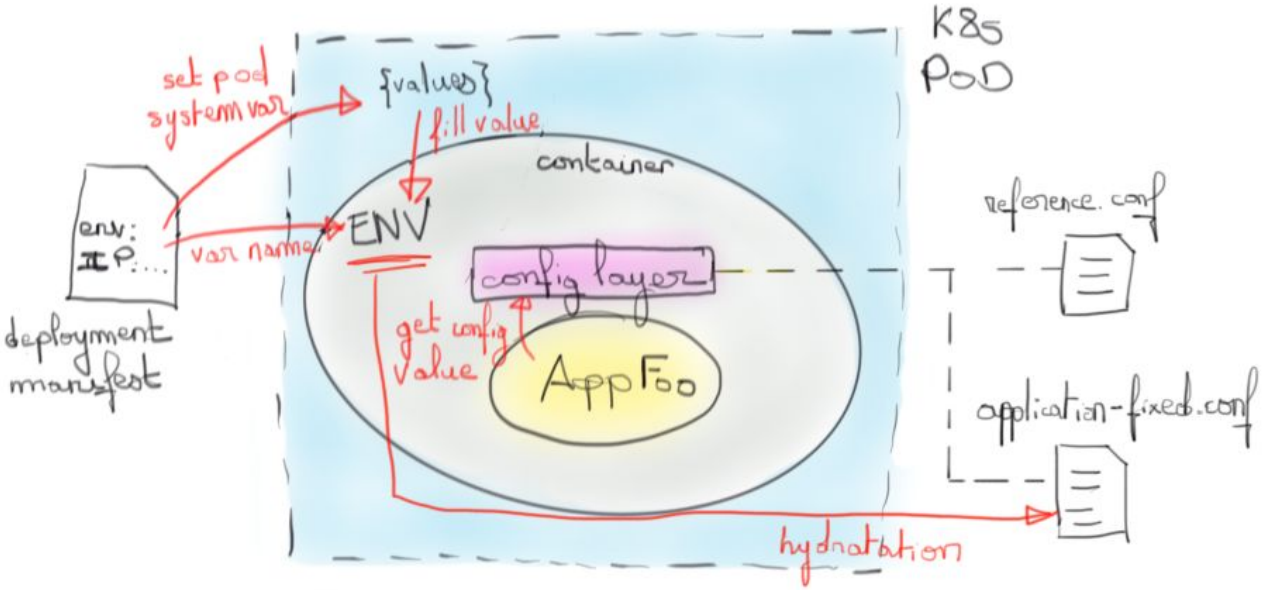
Layered model applied : 1 - reference config



The Lightbend config case

The Rolls Royce of Cloud Native configuration

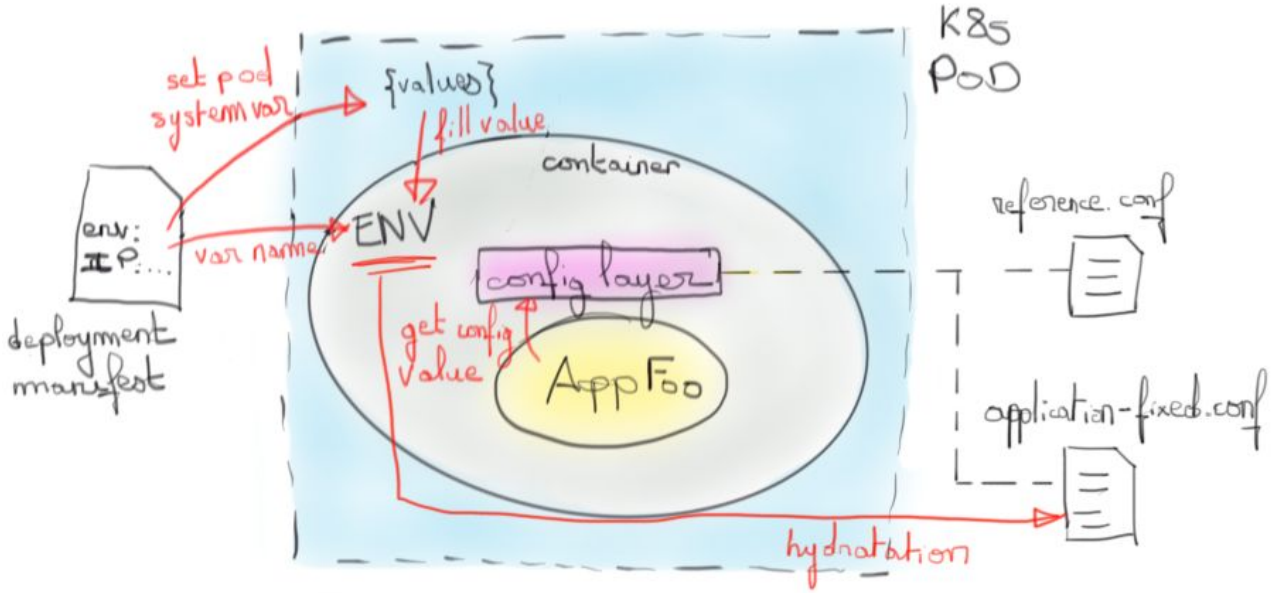
Layered model applied : 2 - Conf bound to the app lifecycle



The Lightbend config case

The Rolls Royce of Cloud Native configuration

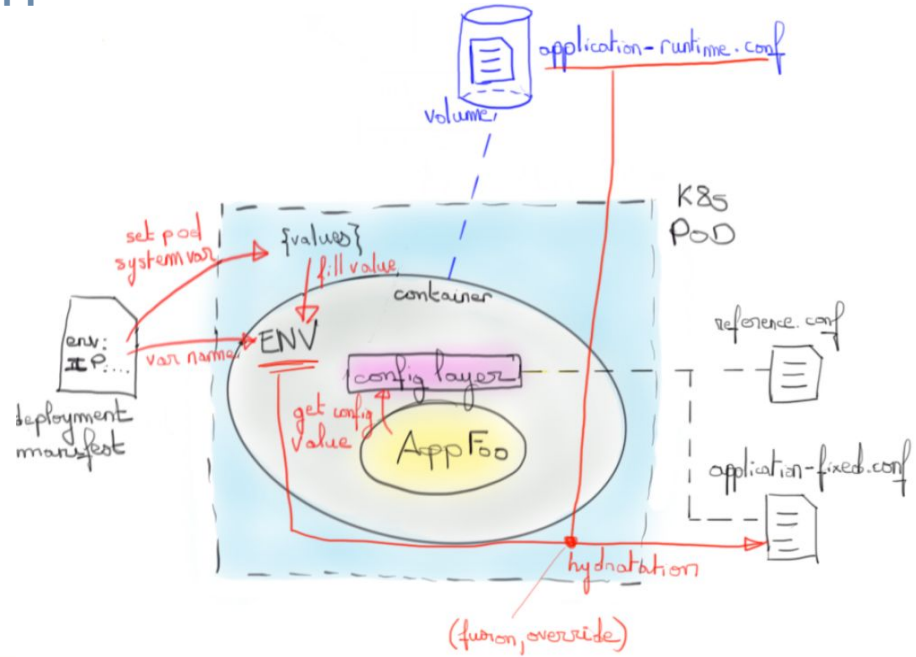
Layered model applied : 2 - Conf bound to the app lifecycle



The Lightbend config case

The Rolls Royce of Cloud Native configuration

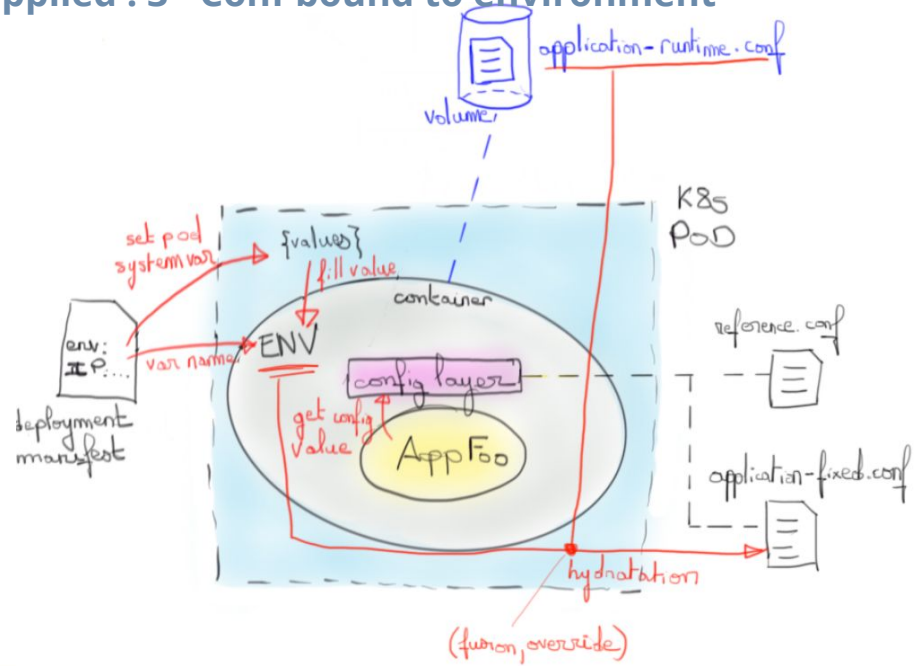
Layered model applied : 3 - Conf bound to environment



The Lightbend config case

The Rolls Royce of Cloud Native configuration

Layered model applied : 3 - Conf bound to environment



Demo

Going further
Links of interest

- **https://github.com/lightbend/config**
- **https://12factor.net/config**
- **https://cloud.spring.io/spring-cloud-config/reference/html/**
- **https://blog.wescale.fr/2020/11/06/lightbend-config-la-configuration-cloud-native/**
- **https://blog.wescale.fr/2021/02/04/le-cloud-lapplication-et-la-configuration/**

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