

Configuration testing for better DevOps

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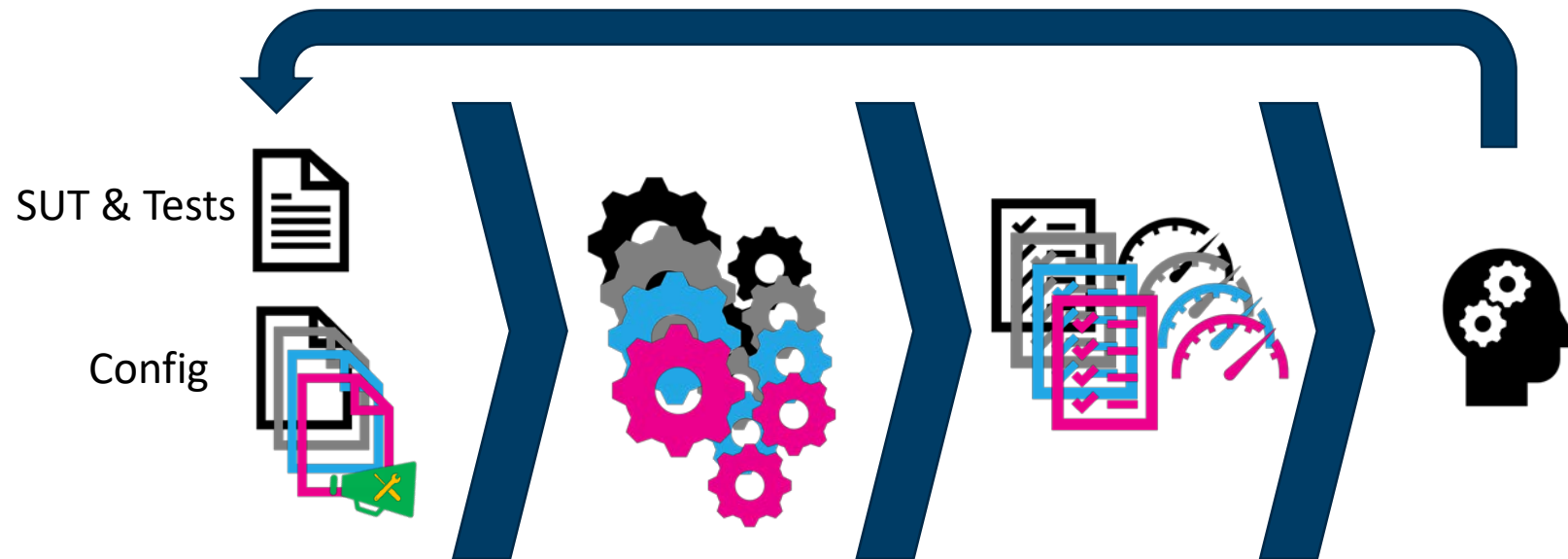
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Agenda

- Configuration testing
- Configuration amplification
- Automation of configuration testing
- Demo

Configuration testing in Nutshell



 Idea 1: Generate different configurations => **Amplification of configurations**

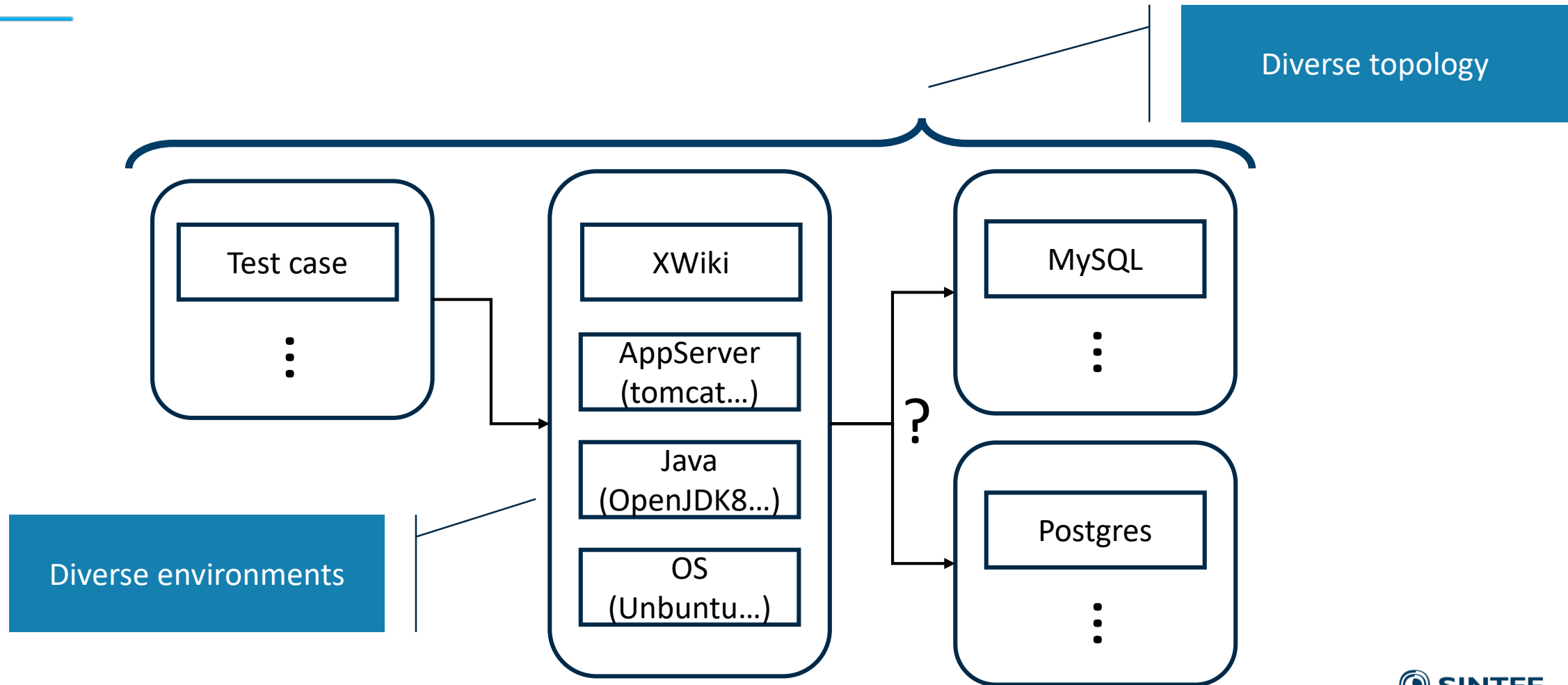
 Idea 2: Integrate into continuous delivery pipeline => **Automation of configuration testing**

Challenges: Configuration testing

- Lacking formalization of configurations
 - Docker
- Lacking formalization of variation points
 - Features
- Lacking formalization of valid configuration
 - Constraints
- Lacking tooling to generate various configuration
 - Configuration amplification
- Lacking tooling to integrate into CI pipeline
 - Configuration Testing Framework



Use-case: XWiki



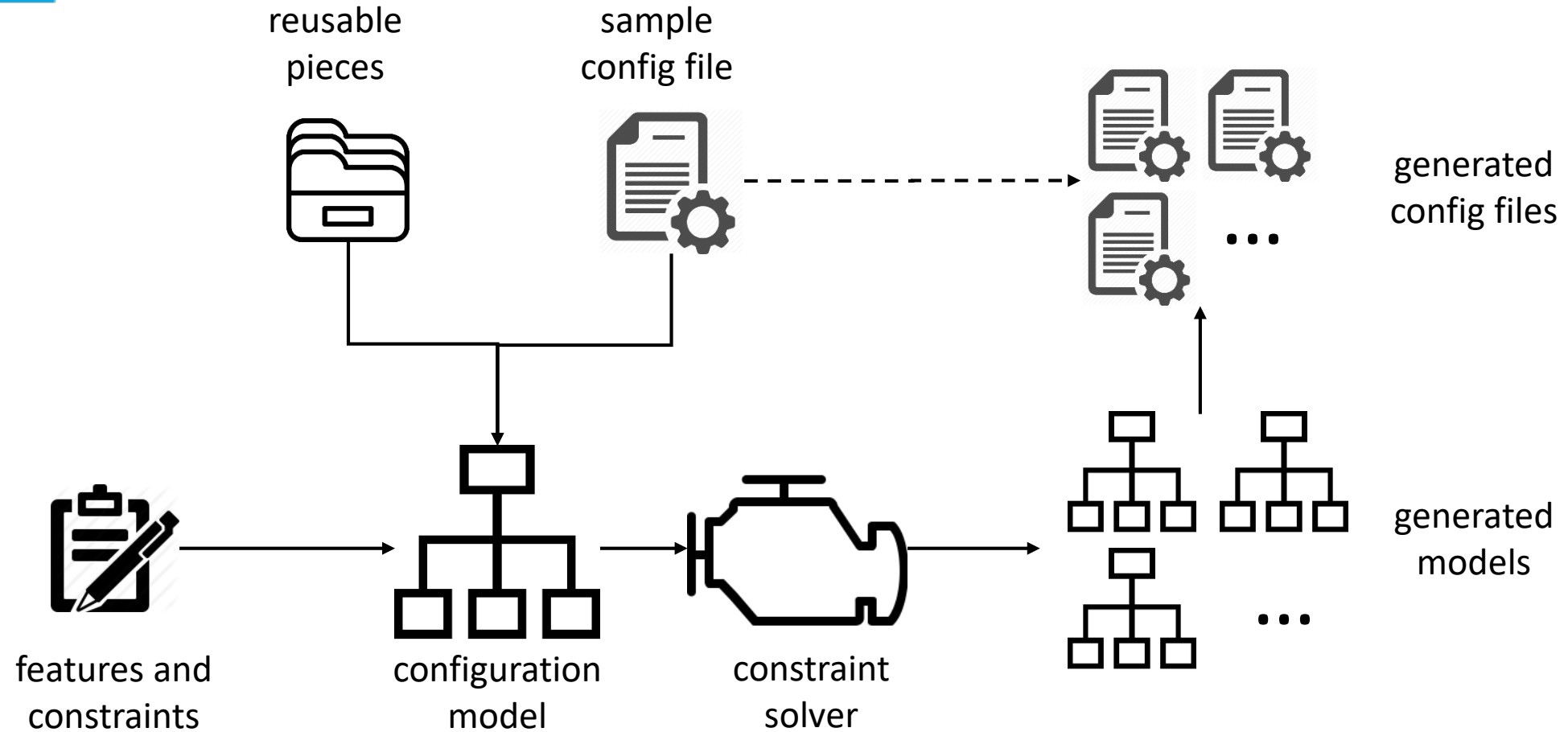


What is configuration amplification

- Environment amplification
 - Monolithic architecture
 - vary libraries, framework versions etc.
- Topology amplification
 - Distributed architectures (microservice, multitier)
 - vary databases, application servers etc.
- Runtime amplification
 - Distributed architectures (microservice, multitier)
 - scaling in/out, restarting services



How to amplify configurations



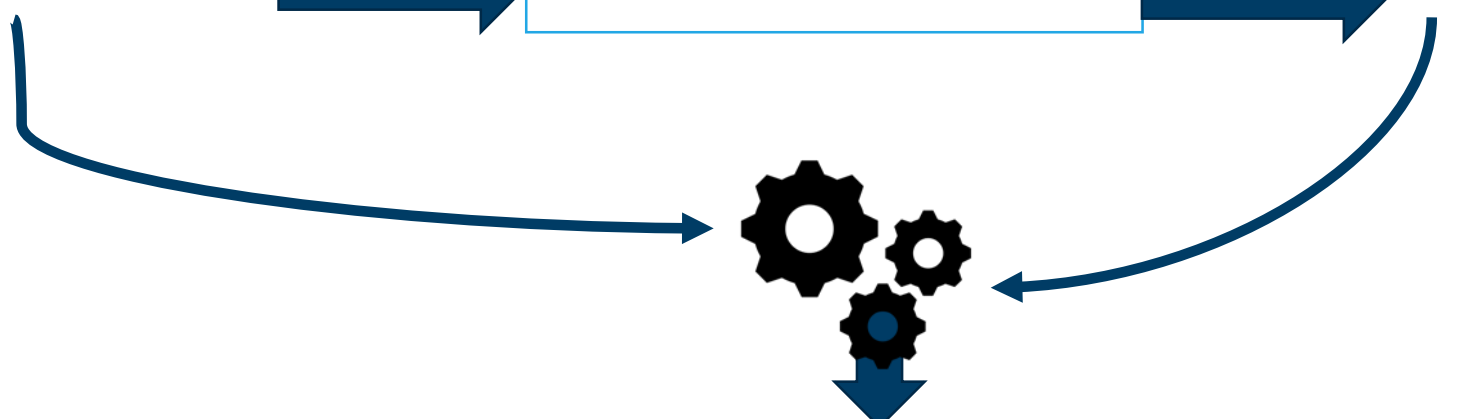
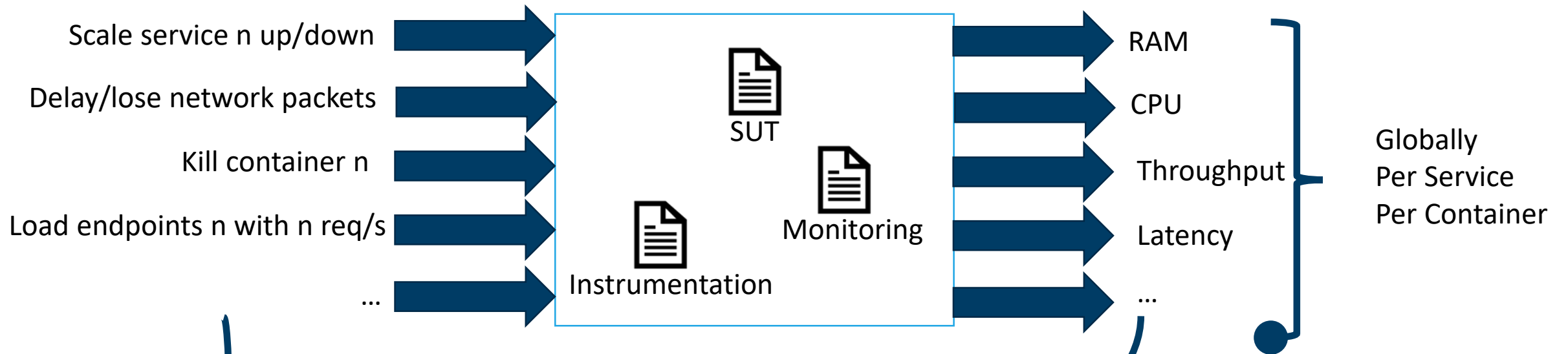


Environment and topology amplification: XWiki

- Features
 - Linux (Alpine, Ubuntu...), Java (OpenJDK9, OpenJDK8..., IBMJDK9...), AppServer (Tomcat8, Tomcat9...), Database (MySQL5, MySQL9..., Postgres9, Postgres10...)
- Reusable pieces
 - Docker files: Tomcat8 (requires Java, introduces Tomcat8)...
 - Standard Images: OpenJDK8, MySQL9
- Put them together in a meaningful way to cover different features
 - Constraint solving and optimization
- Output:
 - Docker images + Docker compose files – ready to run test with one command



Runtime amplification



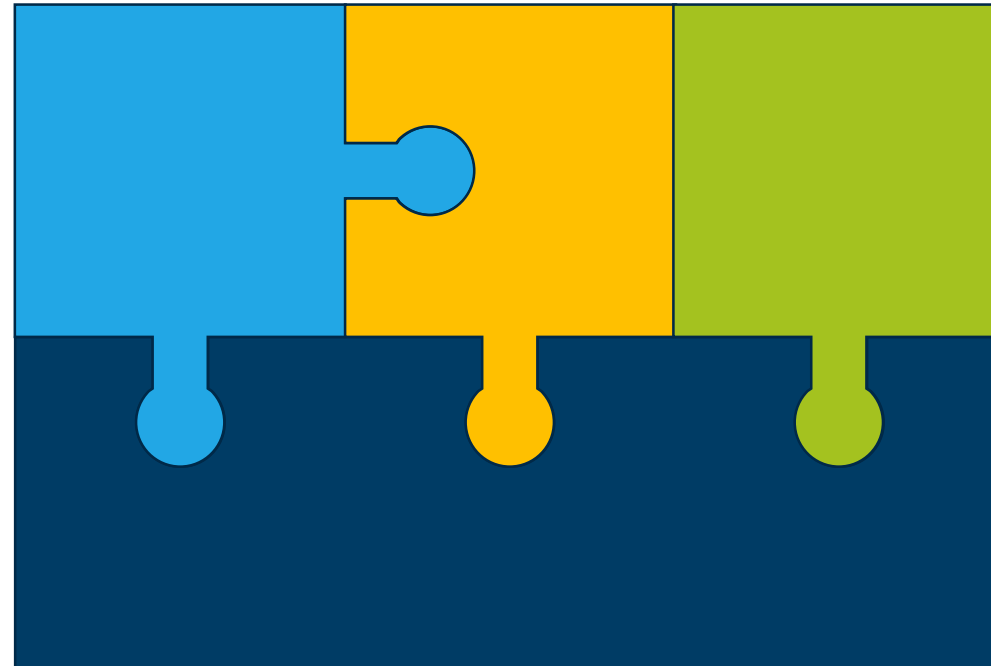
Assess resilience/robustness of the system and help defining auto-scaling, self-healing strategies

Very initial proof-of-concept:
<https://github.com/brice-morin/dracarys>



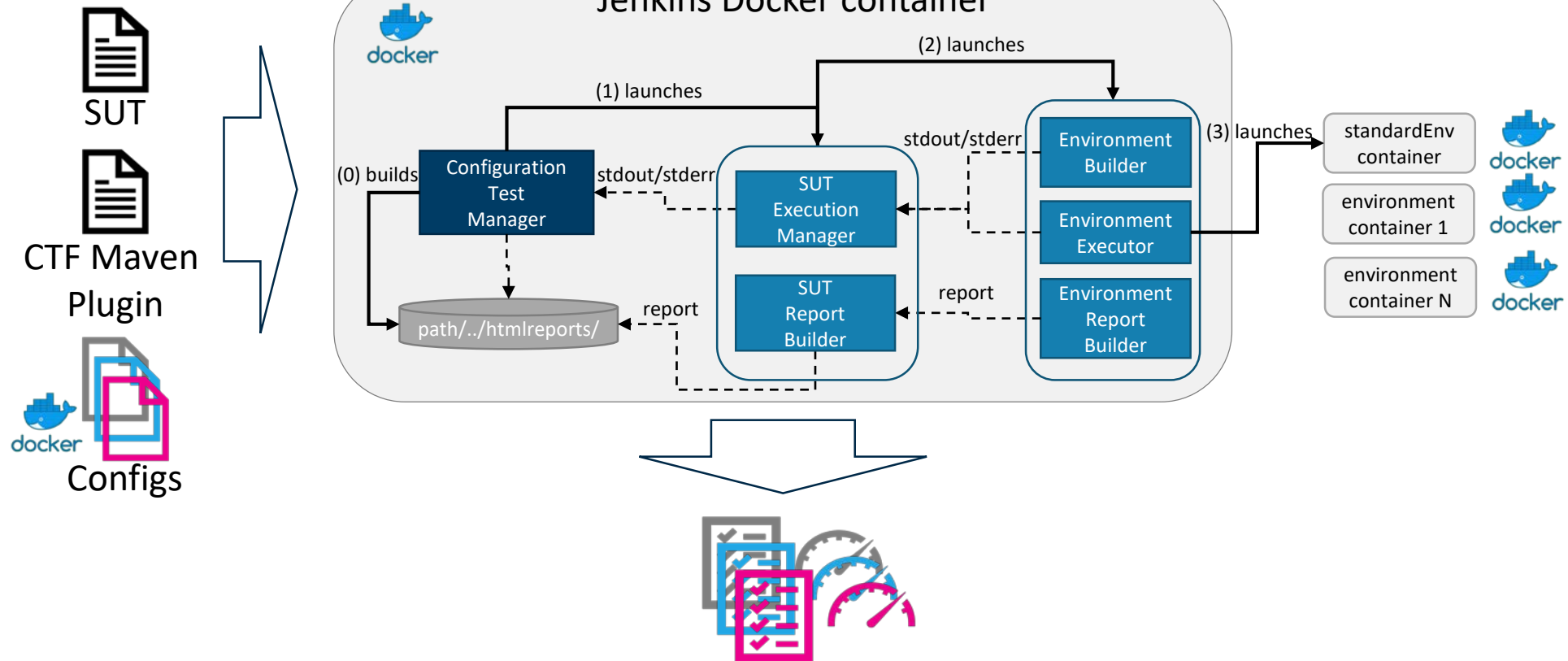
Configuration Testing Framework (CTF)

- Pluggable build/test systems
 - maven
 - ant
 - tox
 - etc
- Pluggable reporting systems
 - mvn site
 - ant
 - etc
- Pluggable infrastructure management
 - sidecar

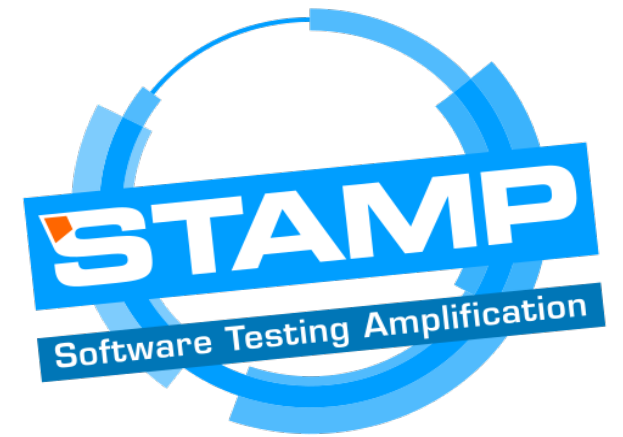




Prototype implementation of CTF



Demo



Links & Contacts

- STAMP Project at <https://www.stamp-project.eu>
- Configuration Testing Framework at <https://github.com/SINTEF-9012/config-testing>
- Environment and topology amplification at <https://github.com/SINTEF-9012/ozepy>
- Runtime amplification at <https://github.com/brice-morin/dracarys>
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Q&A