

Building Universal CI/CD* Pipelines

A vision of a universal, semantically correct, and platform agnostic CI/CD pipeline

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WITTER @lktslionel

2022.12.01

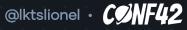


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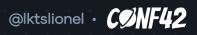
01. History 02. Definitions 03. Core principles 04. Learnings 05. What's next

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Agenda



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01. History		



01. HISTORY

Where it all started



```
pipeline {
                                                                    name: [...]
  agent any
                                                                    on: [...]
  stages {
                                                                    jobs:
    [...]
                                                                      deliver:
    stage("Build") {
                                                                        [...]
      steps {
                                                                        steps:
        sh "rake build VERSION=${env.BRANCH_NAME}"
                                                                        [...]
                                                                        - name: Build
      }
                                                                          run:
                                                                            make build VERSION=${{ env.REF_NAME }}
    stage("package") {
                                                                        [...]
      [...]
      steps {
                                                                        - name: Package
        sh "rake package"
                                                                          run:
      3
                                                                            make package
                                                                        [...]
    stage("publish") {
                                                                        - name: Publish
      [...]
                                                                          [\ldots]
      steps {
                                                                          run:
        sh "rake publish VERSION=${env.BRANCH_NAME}"
                                                                            make publish VERSION=${{ env.REF_NAME }}
      3
    }
                                             Jenkinsfile
                                                                                                   .github/workflows/main.yml
```

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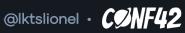


Where it all started



```
stages:
                                                                  - build
                                                                  - package
                                                                  - publish
stage("Build") {
                                                                build:
    sh "rake build VERSION=${env.BRANCH_NAME}"
                                                                  stage: build
ξ
stage("package") {
                                                                    - make build VERSION=$CI COMMIT REF NAME
                                                                package:
                                                                  stage: package
    sh "rake package'
                                                                    - make package
stage("publish") {
                                                                publish:
                                                                  stage: publish
    sh "rake publish VERSION=${env.BRANCH_NAME}"
                                                                    - make publish VERSION=$CI_COMMIT_REF_NAME
3
                                         Jenkinsfile
                                                                                                           .gitlab-ci.yml
```

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DISCLAIMER

You're encourage to steal, use or do whatever you want with the ideas I'm going to share as long as these enable you to build better* software



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02. Defin	itions	



It is my belief that many of the unsolved problems in the information technology (IT) field remain unsolved simply because our technical vocabulary is impairing our ability to speak and reason about these problems. Our contemporary technical vocabulary often redefines words from everyday use and from mathematics and logic in subtly different, often confusing, and sometimes mistaken ways."

- TED HILLS, NOSQL AND SQL DATA MODELING

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°02. DI	ÈFIÑ	IITIC	DNS
CI/C	D*		

CI/CD* stands for Continuous Integration & Continuous Delivery

* Continuous Deployment (automated)

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°02. I	DEFIN	VITIC	DNS	
CI/	CD	Pip	eline	es

CI/CD Pipeline is a workflow triggered by any mean to automate every steps or activities involved in the delivery of fit for purpose (FRs) and fit for use (NFRs) software.

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02. DEFINITIONS CI/CD* Pipeline	es						<u>8</u>	
			Sta	iges				
	Source	Build	, Te		Dublich	•• 🔊 ••		
Trigger	Source	Task 1 Task 2		est ►	Publish	Gates	Live	
		Task 3						
		Task N						
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02.	DÈ	FIÑ	ITIC	DN	S

Meaning of "Universal"

Applicable everywhere or in all cases; general

Used or understood by all

- COLLINS DICTIONARY

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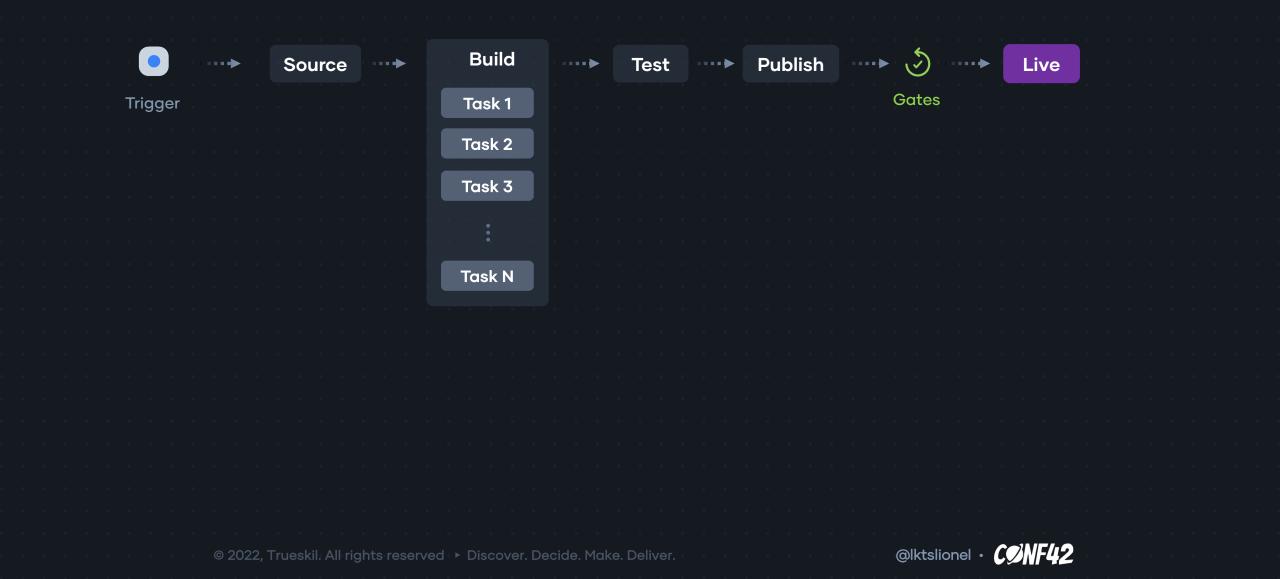
03. CORE PRIN Principles of	ICIPLES If universal CI/CD pipelines	
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* Empower ownership and shared responsibility/governance

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Build a ubiquitous CI/CD pipeline



03. CORE PRINCIP				
Bulla a upiquit	ous CI/CD pipeline		· · · · · · · · · · · · · · ·	
· · • • • • •	Source			
Trigger				
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Build a ubiquitous CI/CD pipeline





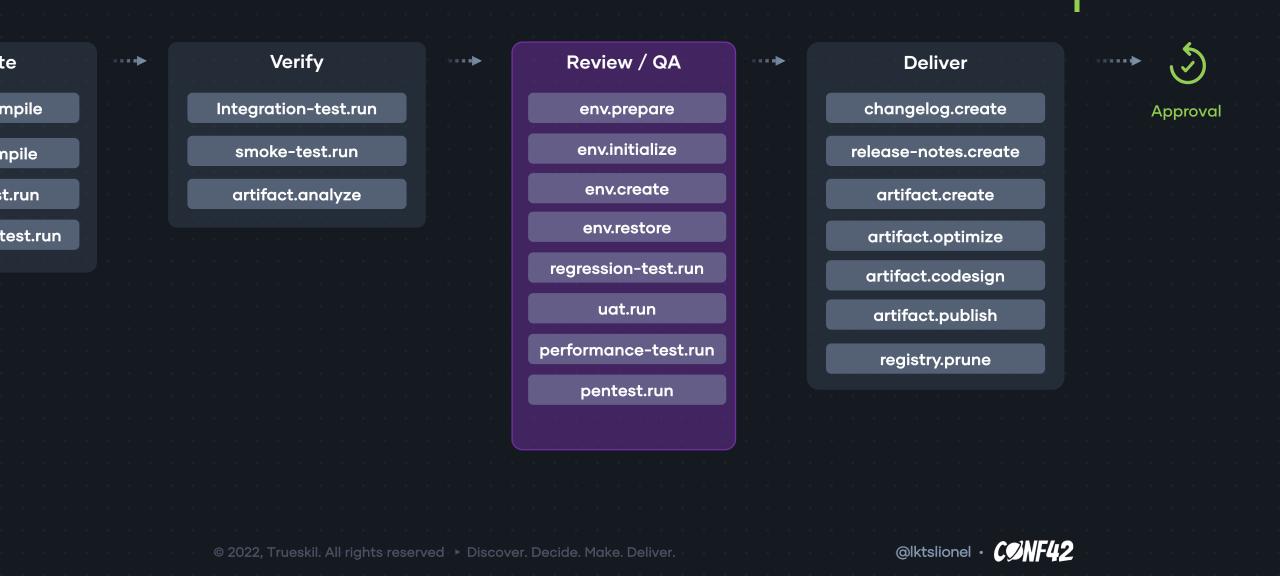
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Build a ubiquitous CI/CD pipeline

CONTINUOUS INTEGRATION & DELIVERY

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Build a ubiquitous CI/CD pipeline

CONTINUOUS INTEGRATION & DELIVERY

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Live	
env.prepare	
env.initialize	
env.create	
env.restore	
rollout.prepare	
rollout.execute	
rollout.validate	
rollout.release	

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	3. CORE PRINCIPLES Suild a ubiquitous CI/CD pipeline > Implementation
· · · · · · ·	Requirements
	 Tasks managers: Make, Task, Rake, Batect
	 Project generators : Projen, Hygen, Caz, Yeoman
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Build a ubiquitous CI/CD pipeline ► Implementation

🗋 tasks **C** scripts Code.synth Code.lint Code.analyze license.check code.synth.make 🖹 code.lint.make 🖹 code.analyze.make license.check.make Ê Makefile

非 非 @task: code.synth 非	
.PHONY: code.synth code.synth: \$(MK_ENV_VARS) tasks/scripts/\$@ \$(filter-out \$@,	,\$(MAKECMDGOALS))
	code.synth.make
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非 非 INCLUDES 非	
<pre>include \$(wildcard tasks/*.make)</pre>	
	Makefile

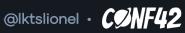
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Build a ubiquitous CI/CD pipeline ► Implementation

name: [...] on: [...] jobs: source: [...] steps: [...] - name: Checking License run: make license.check - name: Synth run: make code.synth $[\ldots]$ - name: Lint run: | make code.lint [...] - name: Analyze $[\ldots]$ run: | make code.analyze .github/workflows/main.yml

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03. CO	RE PR	INCÎ	PLÈS
Platfo	orm /	Agno	bstic



Manifest file to define your workflows

• An Engine well integrated with CI/CD* Platforms

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Platform Agnostic ► Implementation

Dagger is a programmable CI/CD Engine



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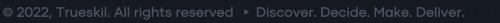


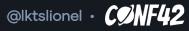
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Platform Agnostic ► Implementation

Demo







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- Focus more on semantics and less on technologies/tools
- Ease onboarding for new comers in IT
- SDKs enhance the Dev Ex and easy adoption
- Dagger makes tasks managers useless

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1. UNIVERSAL PROJECT SPECIFICATION - UPS

- Universal Project Folder Structure
- Tooling
- Patterns and guidelines
- 2. UNIVERSAL CODE DOCUMENTATION SPECIFICATION UCDS
 - Language specification
- Generators

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