



From Silos to DevOps to Platform Engineering

Embracing GitOps and
going behind the hype



Horacio Gonzalez



Horacio Gonzalez



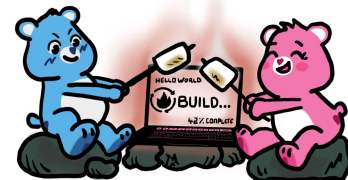
@LostInBrittany

Spaniard Lost in Brittany

Head of DevRel



clever cloud



clever cloud

@LostInBrittany

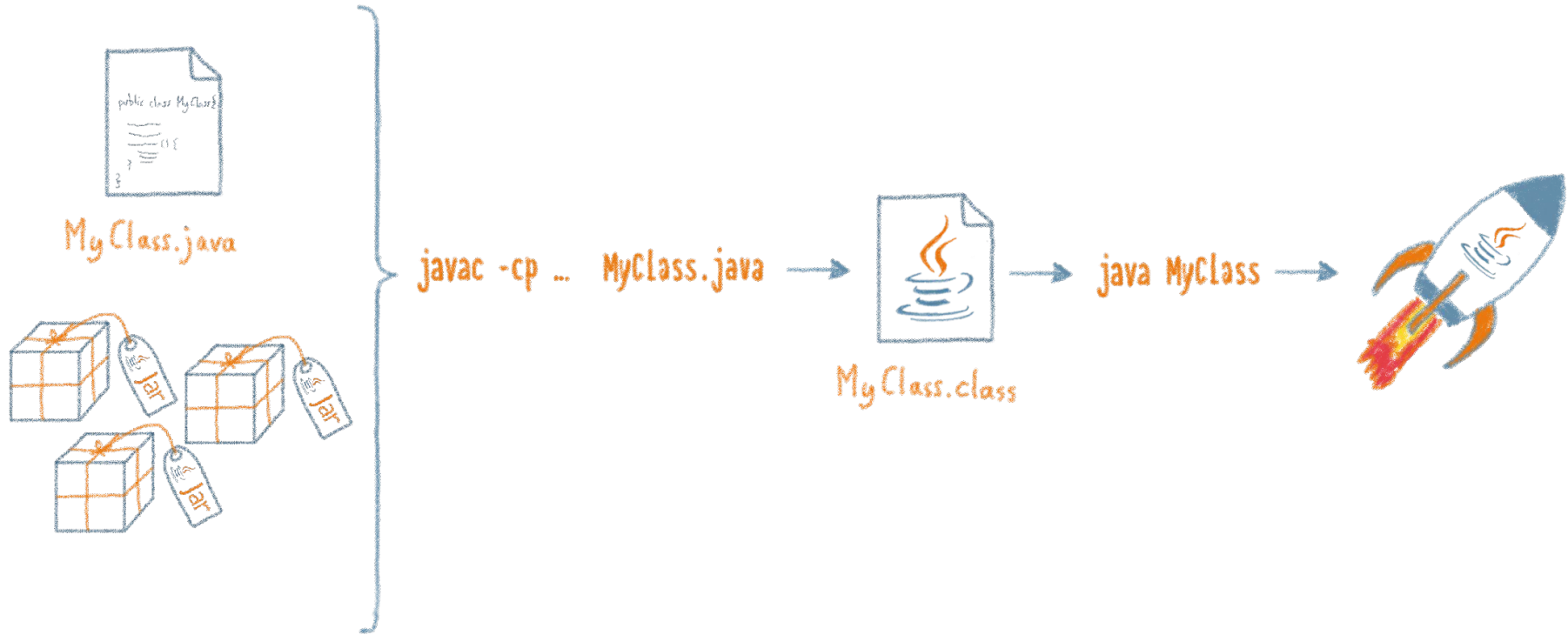


Adding layers of shiny complexity

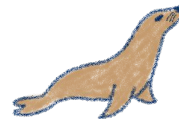
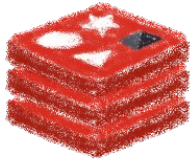
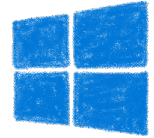
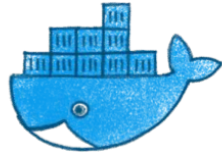
Last 30 years in software development



From write-compile-exec to Kubernetes



From write-compile-exec to Kubernetes



If I were a student now, I would feel scared



Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at lcn.cfo.io

Cloud native landscape 1.0

Database, Streaming & Messaging, Application Definition & Image Build, Continuous Integration & Delivery, Platform, Serverless

Scheduling & Orchestration, Configuration & Service Discovery, Remote Procedure Call, Service Proxy, API Gateway, Service Mesh

Cloud Native Storage, Container Runtime, Cloud Native Network

Automation & Configuration, Container Registry, Security & Compliance, Key Management

Monitoring, Observability and Analysis

CD Foundation Landscape

Logging, Tracing, Check Engineering, Continuous Optimization

Kubernetes Certified Service Provider, Kubernetes Training Partner, Certified CNPs

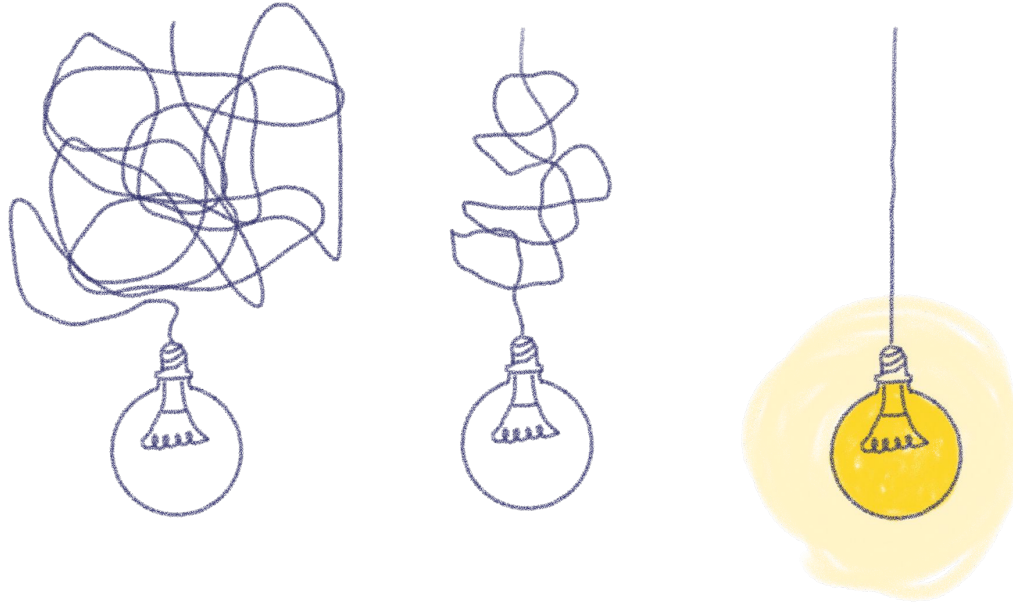
Cloud Native Landscape

This landscape is intended as a map through the previously articulated terrain of cloud native technologies. There are many routes to discovery a cloud native application with CNCF projects representing a particularly well-trodden path.

lcn.cfo.io



Platform Engineering to the rescue



Empowering developers while reducing complexity



clever cloud

@LostInBrittany



IT in the 90s

Once upon a time...



In a time almost forgotten



When even internet was young...



When Windows 95 was the cutting edge



And a 100 Mb disk was huge...

Big companies still used mainframes



Bigger, fancier, but still the same old IBM

Bare-metal based IT reigned



Control, reliability, security...
But cost, rigidity, logistics...



Applying the industrial model



Trying to shoehorn IT into a model where it doesn't fit



Walls & Silos



Project
Owners

Developers

Sys Admin

Ops

And procedures, and hierarchy, and corporate politics

Why are we managing IT like factories?



Because we didn't know otherwise?



Rémi Verchère ❄️

@rverchere

bash will still be used

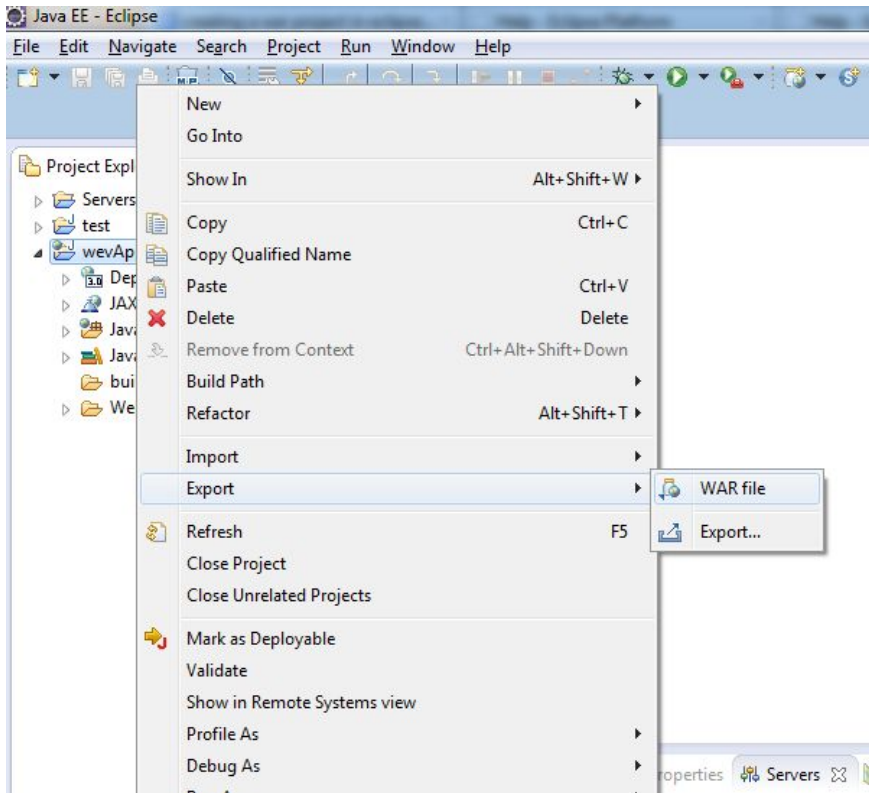
7:46 PM · Aug 8, 2023 · **290** Views

Tooling evolves

CVS, Ant and (Leeeroy) Jenkins



Old school procedures



Download Apache Commons IO

Using a Mirror

We recommend you use a mirror to download our release builds, but you **must verify the integrity** of the downloaded files using signatures downloaded from our main distribution directories. Recent releases (48 hours) may not yet be available from all the mirrors.

You are currently using <https://dtdn.apache.org/>. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are backup mirrors (at the end of the mirrors list) that should be available.

Other mirrors:

It is essential that you **verify the integrity** of downloaded files, preferably using the **PGP** signature (`*.asc` files), falling that using the **SHA512** hash (`*.sha512` checksum files).

The **KEYS** file contains the public PGP keys used by Apache Commons developers to sign releases.

Apache Commons IO 2.13.0 (requires Java 8)

Binaries

commons-io-2.13.0-bin.tar.gz	sha512	pgp
commons-io-2.13.0-bin.zip	sha512	pgp

Tooling empowering changes



Theory existed since 1999
But without the right tooling...

Source control tools



ClearCase



Better than copying and renaming folders...



Dependency management & build



The agile dependency manager



Better than grabbing each dependency in their website
and running `javac` by hand...



Unit testing and continuous integration



Hudson CI



Jenkins

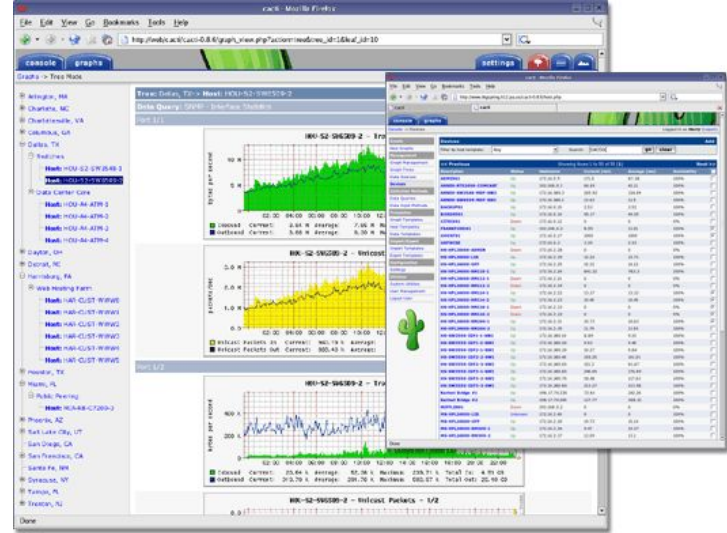
If *Testing is Doubting*, let's doubt automatically

Monitoring tools



Nagios

ZABBIX



No more spending nights looking at a status screen



So many more possibilities...



So much more complexity!





Rémi Verchère ❄️

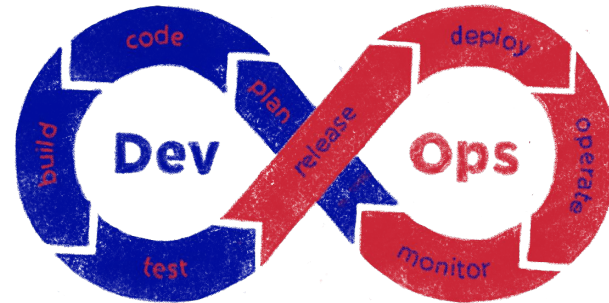
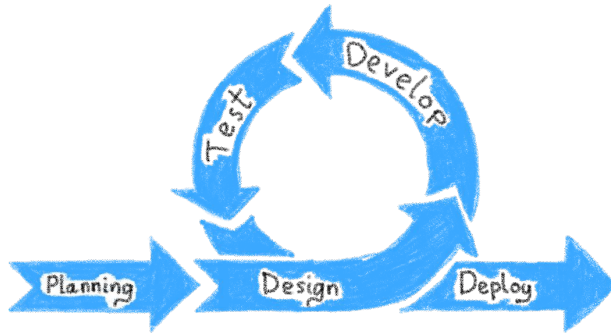
@rverchere

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XP, agility and DevOps

Buzzwords that changed the IT





The Values of Extreme Programming

Extreme Programming (XP) is based on values. The rules we just examined are the natural extension and consequence of maximizing our values. XP isn't really a set of rules but rather a way to work in harmony with your personal and corporate values. Start with XP's values listed here then add your own by reflecting them in the changes you make to the rules.

Simplicity: We will do what is needed and asked for, but no more. This will maximize the value created for the investment made to date. We will take small simple steps to our goal and mitigate failures as they happen. We will create something we are proud of and maintain it long term for reasonable costs.

Communication: Everyone is part of the team and we communicate face to face daily. We will work together on everything from requirements to code. We will create the best solution to our problem that we can together.

Feedback: We will take every iteration commitment seriously by delivering working software. We demonstrate our software early and often then listen carefully and make any changes needed. We will talk about the project and adapt our process to it, not the other way around.

Respect: Everyone gives and feels the respect they deserve as a valued team member. Everyone contributes value even if it's simply enthusiasm. Developers respect the expertise of the customers and vice versa. Management respects our right to accept responsibility and receive authority over our own work.

Courage: We will tell the truth about progress and estimates. We don't document excuses for failure because we plan to succeed. We don't fear anything because no one ever works alone. We will adapt to changes when ever they happen.

What lessons have we learned about implementing XP so far. 🤖👉

[ExtremeProgramming.org home](#) | [XP Rules](#) | [XP Map](#) | [Lessons Learned](#) | [About the Author](#)

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Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

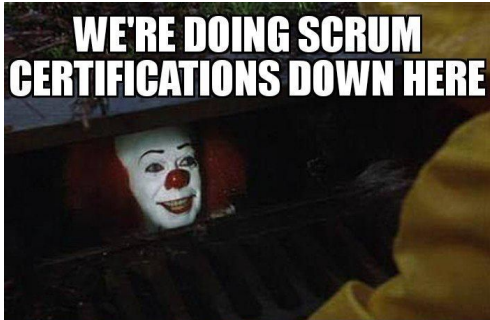
That is, while there is value in the items on the right, we value the items on the left more.



Breaching walks, breaking down silos

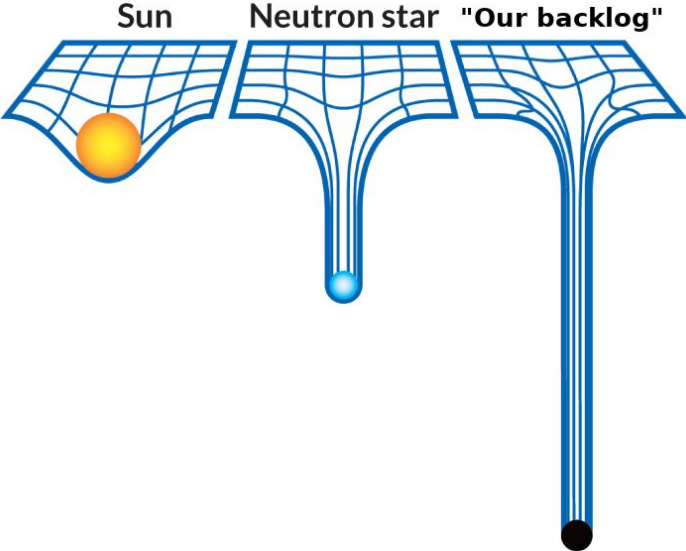


The business of Agility

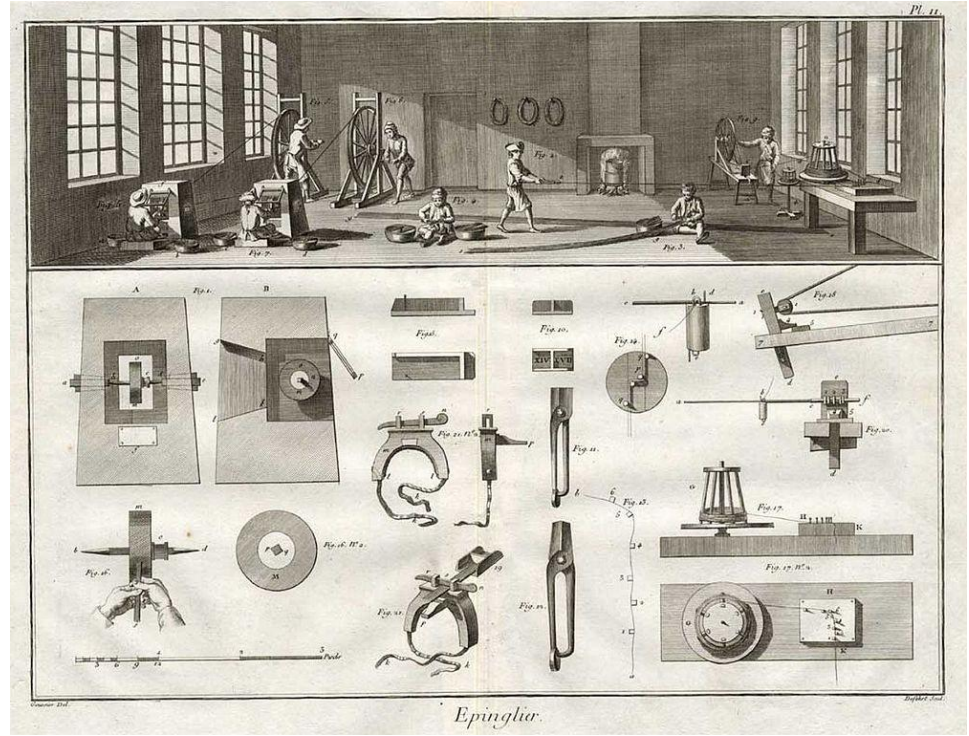


The Dark Side rises

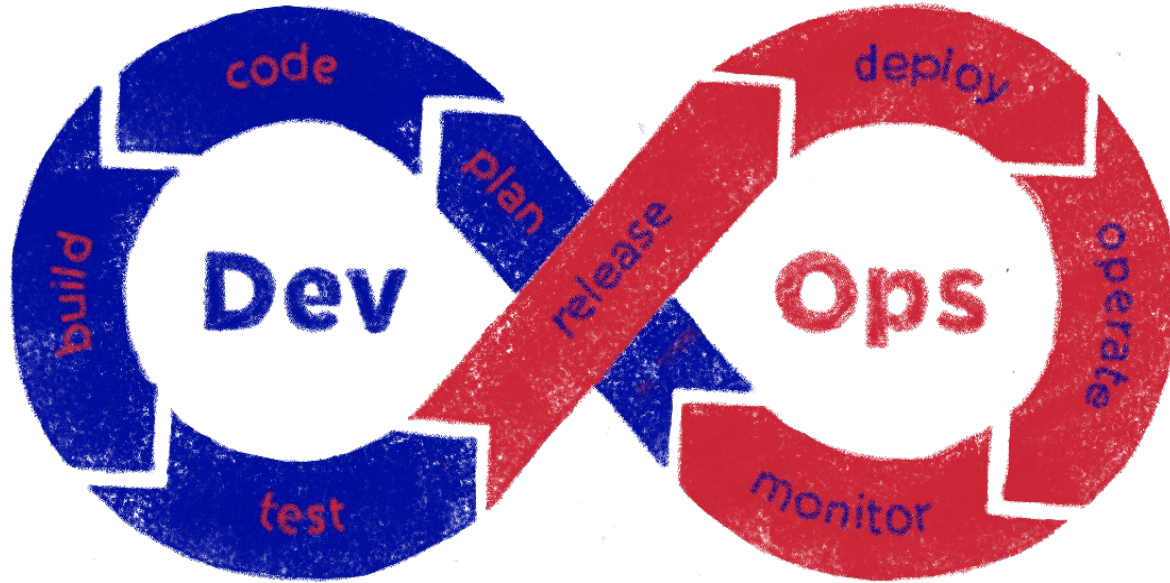
Agile Tooling



Back to industrial practices ?



DevOps: breaking Dev and Ops Silos

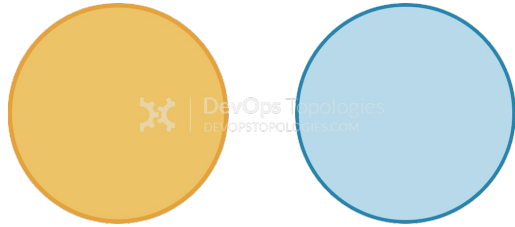


DevOps is a reaction to the wall of confusion



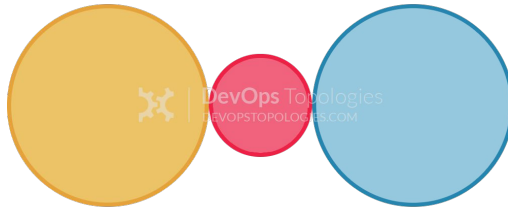
Making the different stakeholders
to work together in sync

DevOps anti patterns



• Dev

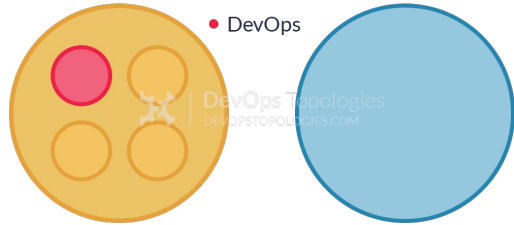
• Ops



• Dev

• DevOps

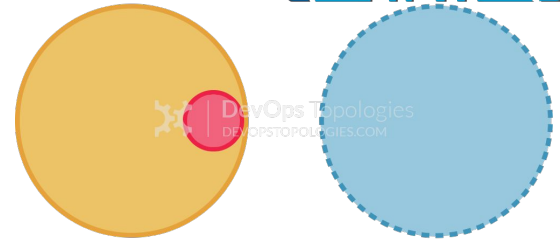
• Ops



• DevOps

• Dev

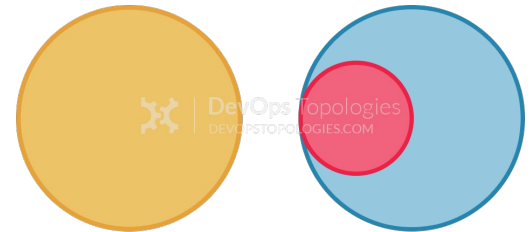
• Ops



• Dev

• DevOps

• Ops



• Dev

• DevOps

• Ops



More in [DevOps Topologies](https://www.devopstopologies.com) site

DevOps also has another Dark Side



A DevOps engineer is an IT generalist who should have a wide-ranging knowledge of both development and operations, including coding, infrastructure management, system administration, and DevOps toolchains.



WTF is a DevOps Engineer? And a DevSecOps?
A DevMLOps? A DevAiDataSecOps? A Dev*Ops?

So we have Cults of Agility and Dev*Ops



And so much more complexity!



Rémi Verchère ❄️

@rverchere

bash will still be used

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Enter the Cloud

Renting server time in other's people infra

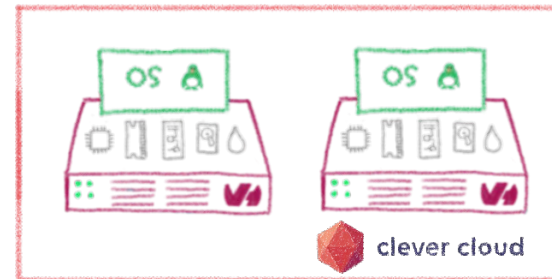
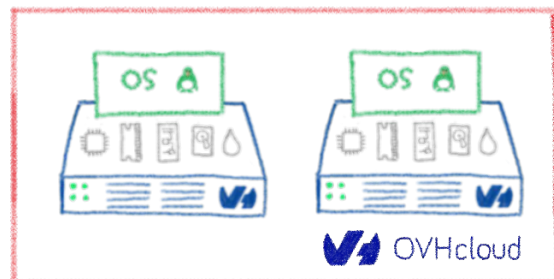
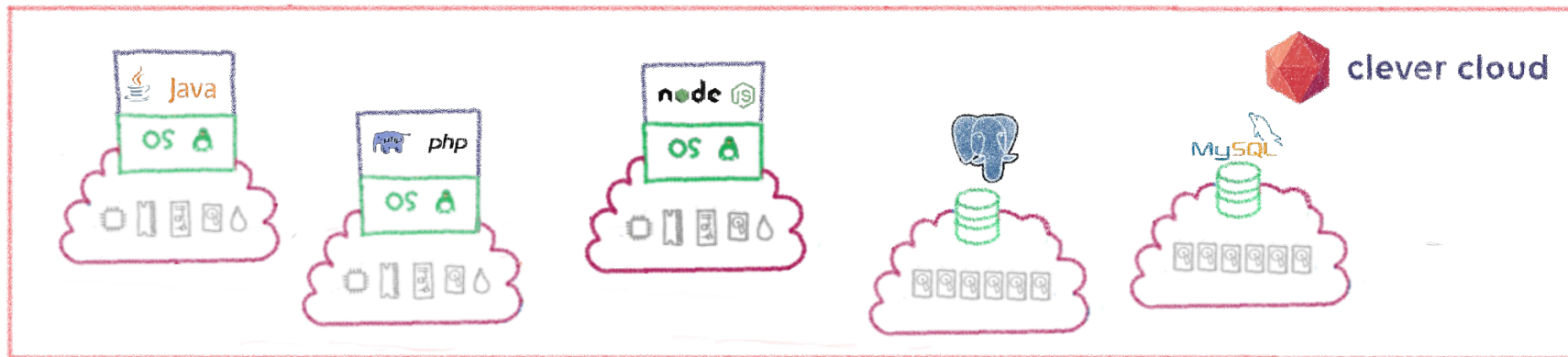


From virtualisation to the cloud



How to use the infrastructure at its full capacity

Cloud demands automation



It changes the way how IT works



Bon de commande

Logo

Mon Entreprise
22, Avenue Voltaire
15000 Marseille, France
Téléphone : +33 4 92 99 99 99

Destinataire
Acheteur SA
Michel Acheteur
31, rue de la Forêt
13100 Aix-en-Provence
France

Date : 4.8.2020
Bon de commande N° : 123
Numéro de client : 456
Modalité de paiement : 30 jours
Mode de paiement : CB / Chèque
Emis par : Pierre Fournisseur
Contact client : Michael Acheteur
Téléphone du client : 04 82 95 35 56

Informations additionnelles
Merci d'avoir choisi Mon Entreprise pour nos services.
Service après-vente - Garantie : 1 an.

Ref. produit	Description	Quantité	Unité	Prix unitaire HT	% TVA	Total TVA	Total TTC
123456789	Main-d'œuvre	5	h	60,00 €	20 %	60,00 €	360,00 €
987654321	Produit	10	pcs	105,00 €	20 %	105,00 €	1 260,00 €
				Total HT		1 260,00 €	
				Total TVA		270,00 €	
				Frais de livraison		30,99 €	
				Total TTC		1 659,99 €	

Signature :

Siège social
22, Avenue Voltaire
13000 Marseille,
France
N° Siret ou Siret : xxxxxDEVB n° 123
N° TVA intr. : FRXX-99999999

Coordonnées
Pierre Fournisseur
Phone : +33 30 12345678
E-mail : Pierre@mcscopagnie.fr
www.mcscopagnie.fr

Détails bancaires
Banque : NP Paribas
Compte : 10000000
N° de compte : 12345678
IBAN : FR2341010000000000000000000
SWIFT/BIC : FBNP3333

Dashboard Bare Metal Cloud Hosted Private Cloud Public Cloud Web Cloud Telecom Sunrise Marketplace English Horacio Gonzalez

Instances

Horacio's default / Kubernetes / Create a Kubernetes cluster

Create a Kubernetes cluster

1 Select a location

All locations	North America	Central Europe	Western Europe	South-East Asia	Oceania
Beauharnois (BH55)			Frankfurt (DE1)		
Gravelines			Strasbourg (SBG5)		
Singapore (SGP1)			Sydney (SYD1)		
London (UK1)					Warsaw (WAW1)

Storage
Block Storage
Object Storage
Cloud Archive
Cold Archive
Databases
Volume Snapshot
Volume Backup
Instance Backup

Network
Private Network
Public IPs
Gateway

Containers & Orchestration
Load Balancer
Managed Kubernetes Service
Managed Private Registry
Workflow Management

AI & Machine Learning

And it demands a mentality change



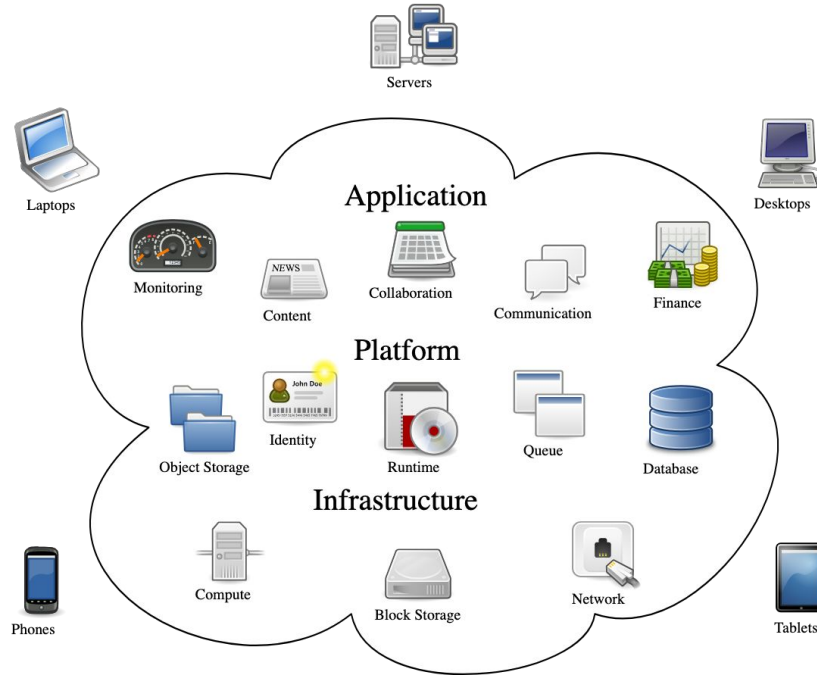
Empowering developers



Infrastructure is only a click away



Distributed is the new black



Cloud Native architectures and services

Sysadmins who code



Creating tools: automation, monitoring, observability...



New roles appear: SRE



WTF is a System Reliability Engineer?

250 cloud products only in this provider...



And so much more complexity!





Rémi Verchère ❄️

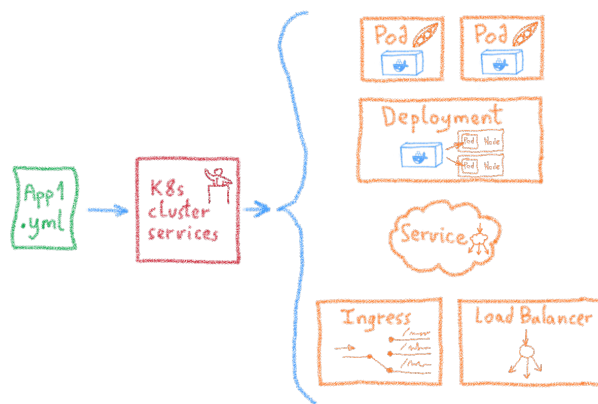
@rverchere

bash will still be used

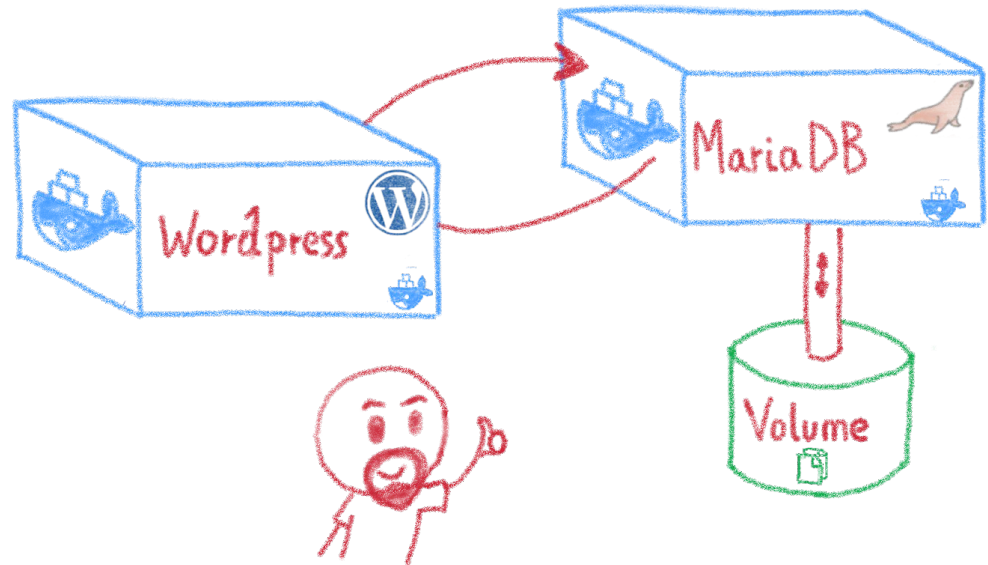
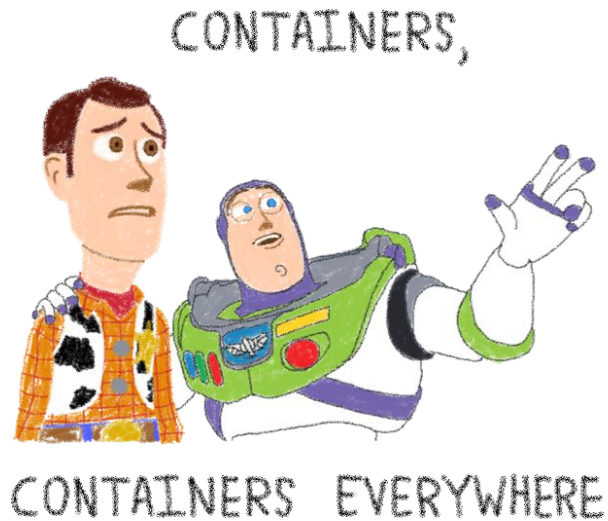
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Declarative Infrastructure

The intern metaphor

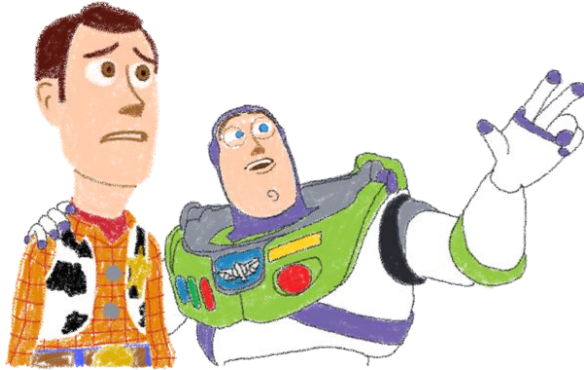


Containers make dev life easier

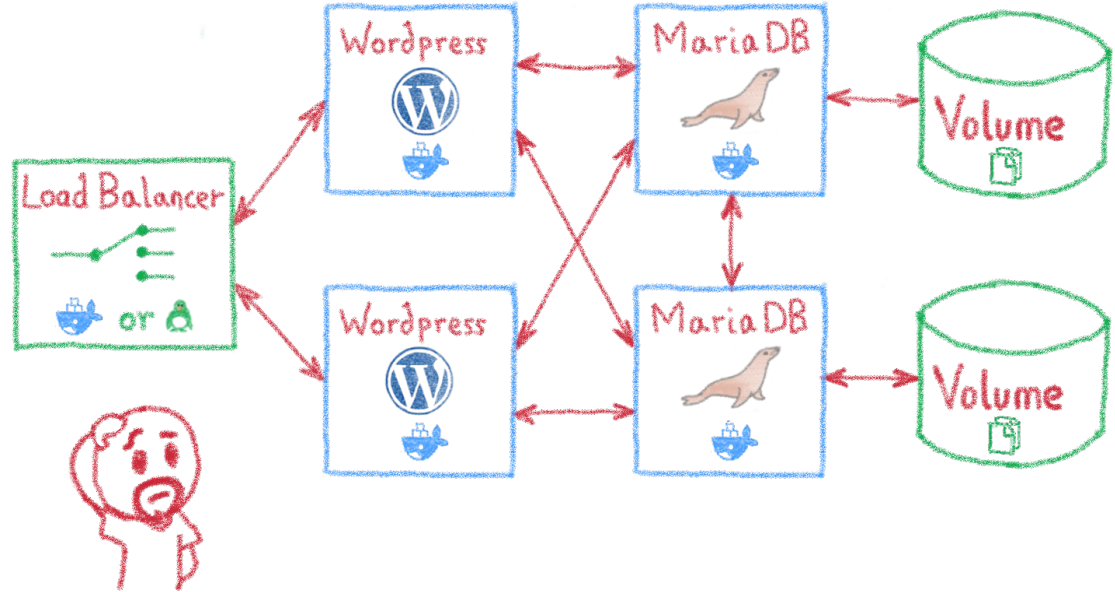


Less simple if you must operate them

CONTAINERS,

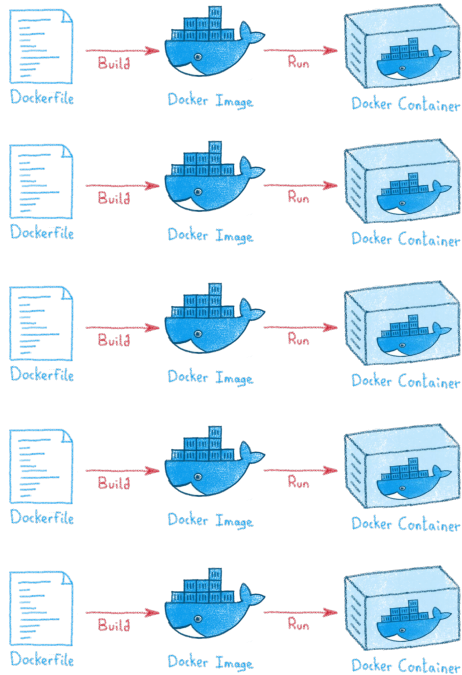


CONTAINERS EVERYWHERE



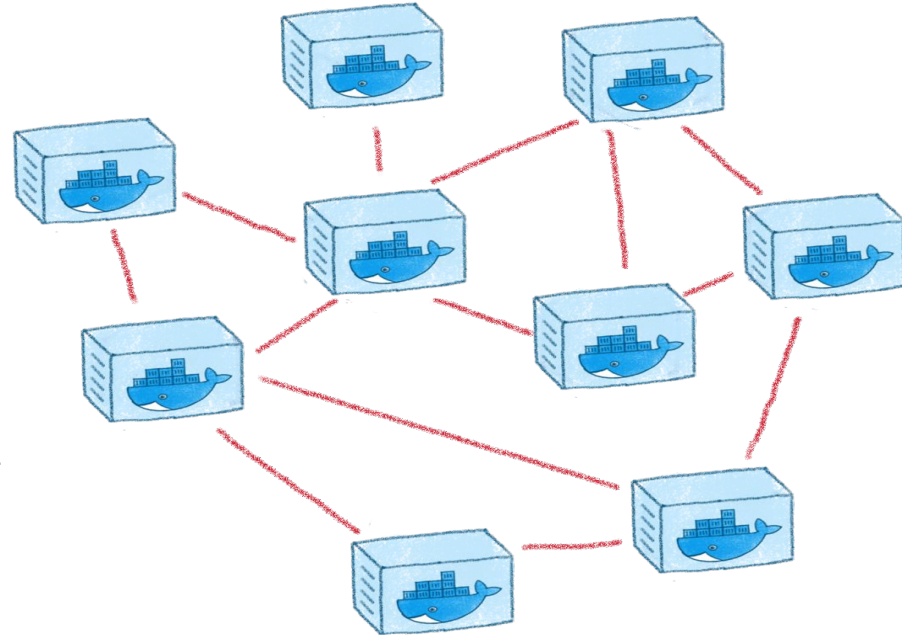
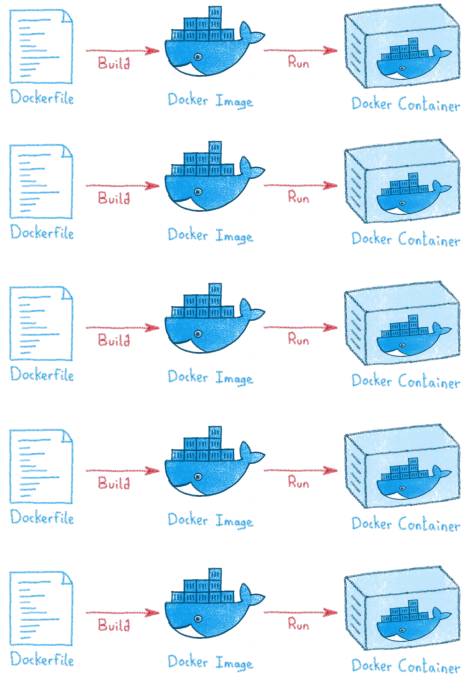
Like in a production context

And what about microservices?



Are you sure you want to operate them by hand?

And what about microservices?

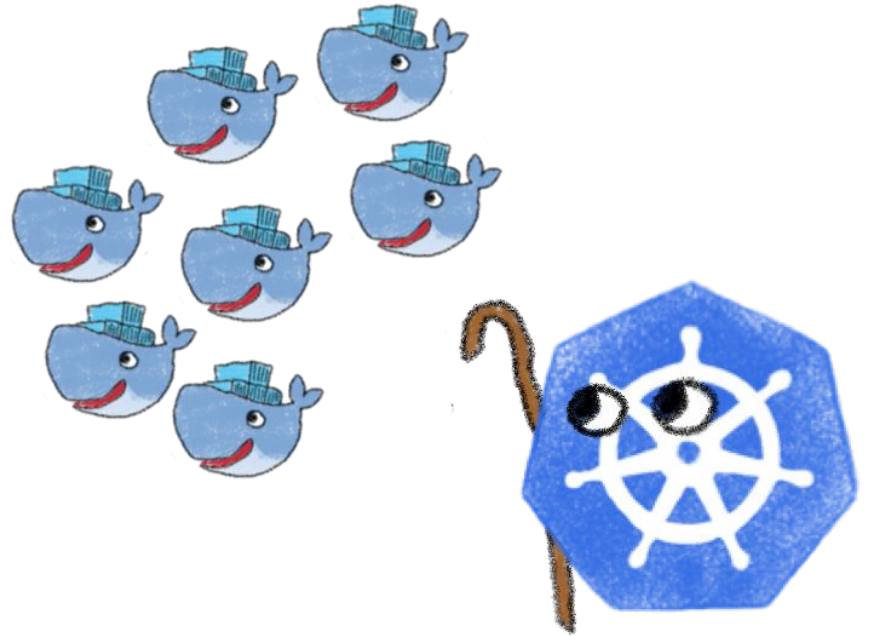


Are you sure you want to operate them by hand?

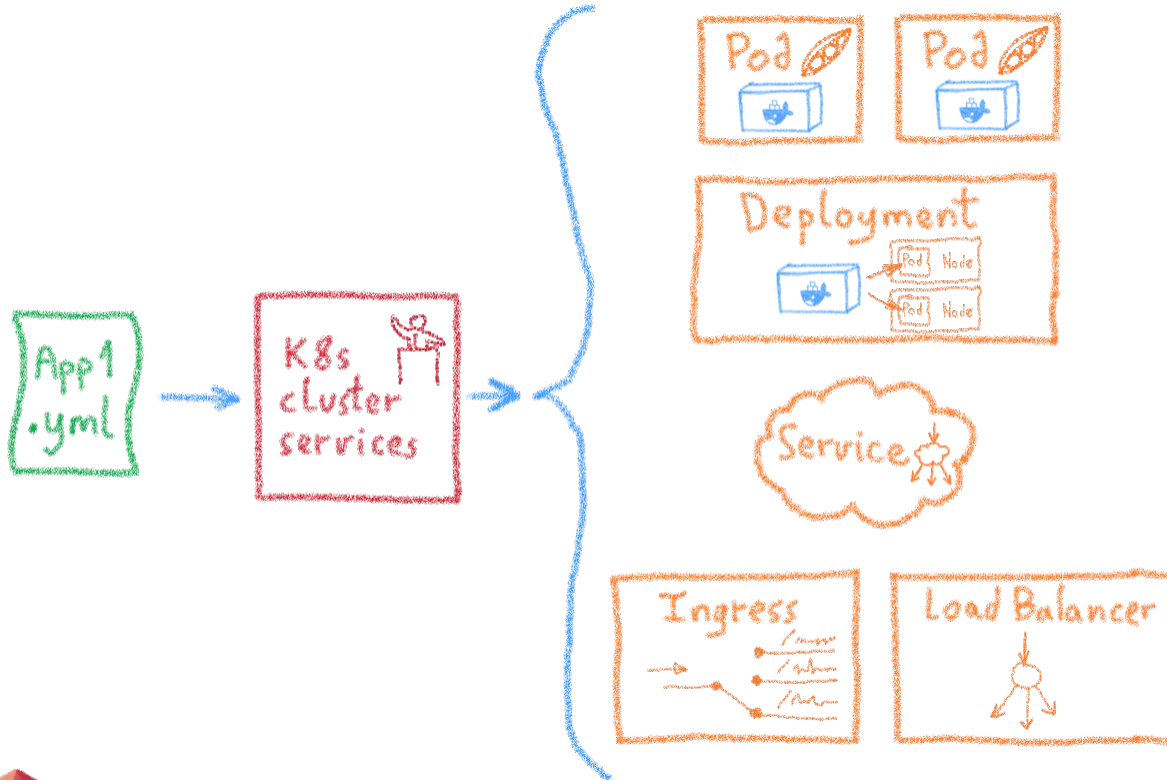
Kubernetes: a full orchestrator

Takes care of:

- Deployment
- Scaling
- Monitoring
- Repairing
- Securing
- ...



Kubernetes - Desired State Management



- Ingress
- Services
- Deployments
- Pods
- Sidecars
- Replica Sets

Infrastructure as Code



• Build 

• Modify 

• Version 

your infrastructure



Containers? Pods? Ansible? Terraform?



So much more complexity!



Rémi Verchère ❄️

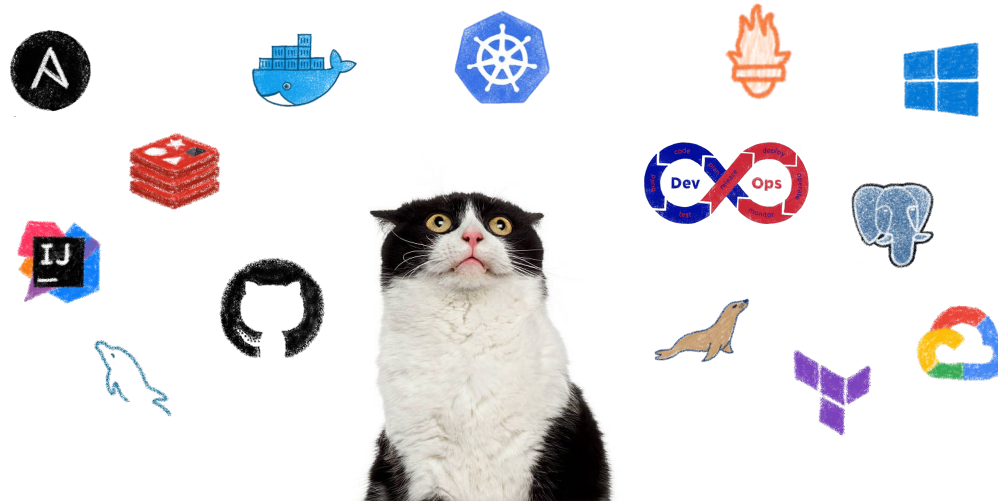
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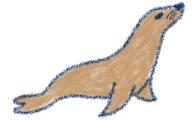
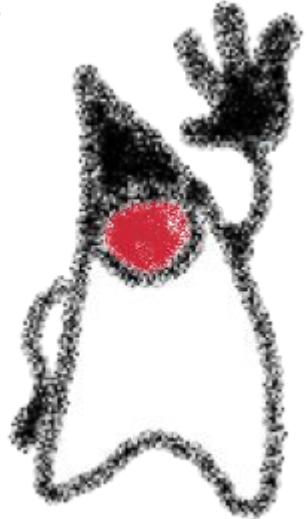
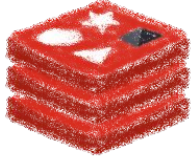
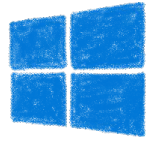
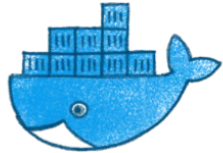
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Becoming a developer in 2024

Do I need to know all that?



So many things to learn...



So many options ...



Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at [Lincf.io](#)

Cloud native technologies are not open source?

The image displays the CNCF Cloud Native Landscape 1.0, a comprehensive grid of logos for various cloud-native technologies. The grid is organized into several categories:

- Application Definition and Development:** Includes logos for KV, V, and various container management tools.
- Database:** Features logos for KV, V, and other database solutions.
- Streaming & Messaging:** Includes logos for Kafka, RabbitMQ, and others.
- Application Definition & Image Build:** Shows logos for Docker, Kubernetes, and related tools.
- Continuous Integration & Delivery:** Includes logos for Jenkins, GitLab, and others.
- Platform:** Features logos for AWS, Azure, and other cloud providers.
- Serverless:** Includes logos for AWS Lambda, Azure Functions, and others.
- Members:** A section for CNCF members.
- CD Foundation Landscape:** Includes logos for ArgoCD, Flux, and others.
- Observability and Analysis:** Features logos for Prometheus, Grafana, and others.
- Monitoring:** Includes logos for Prometheus, Grafana, and others.
- Logging:** Features logos for ELK, Fluentd, and others.
- Check Engineering:** Includes logos for OPA, Falco, and others.
- Continuous Optimization:** Features logos for Knative, and others.
- Automation & Configuration:** Includes logos for Ansible, Terraform, and others.
- Container Registry:** Features logos for Docker Registry, Harbor, and others.
- Security & Compliance:** Includes logos for Aqua, Snyk, and others.
- Key Management:** Features logos for HashiCorp Vault, and others.
- Cloud Native Storage:** Includes logos for MinIO, Ceph, and others.
- Container Runtime:** Features logos for containerd, CRI-O, and others.
- Cloud Native Network:** Includes logos for Cilium, Calico, and others.
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- Check Engineering:** Includes logos for OPA, Falco, and others.
- Continuous Optimization:** Features logos for Knative, and others.



Managing the self-service commodity



4GIFS.com



Shift left and Cognitive Load



Platform Engineering to the rescue

Without adding more complexity?



What's Platform Engineering?



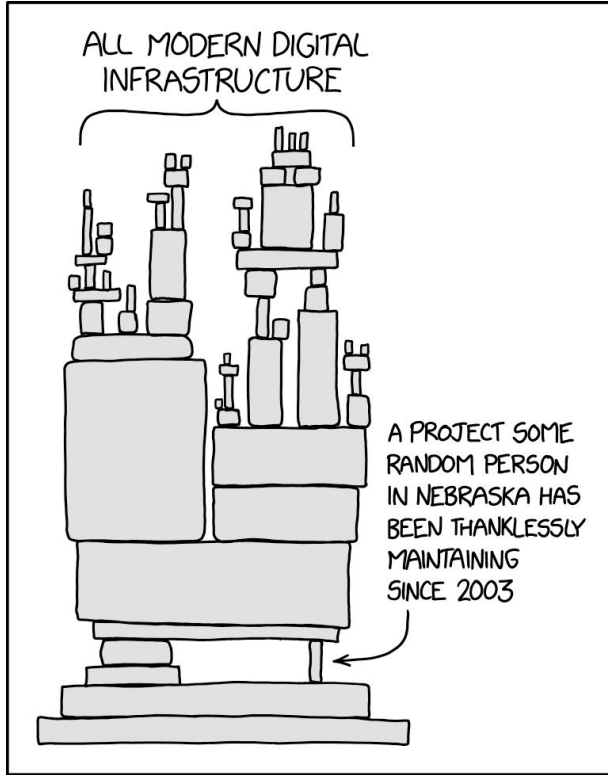
Platform engineering is the discipline of designing and building toolchains and workflows that enable self-service capabilities for software engineering organizations in the cloud-native era.

Platform engineers provide an integrated product most often referred to as an “Internal Developer Platform” covering the operational necessities of the entire lifecycle of an application.

Lucca Galante

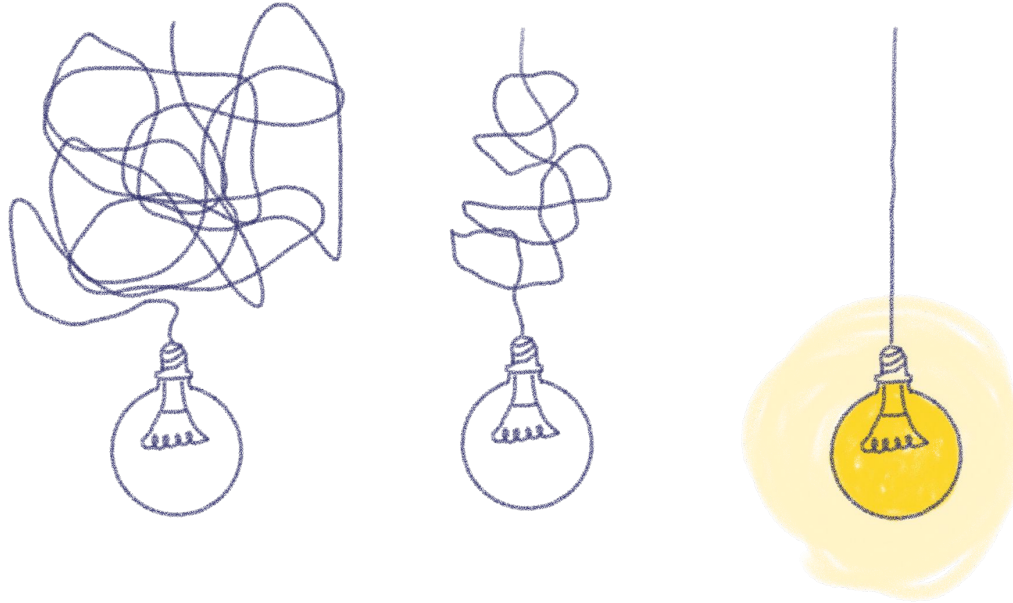


A fancy name for something already there



Most companies already have
some kind of platform
Often homemade...

The purpose of Platform Engineering



Empowering developers while reducing complexity



@LostInBrittany



But how can we create them?





GitOps



What is GitOps?



Git is the
single source
of truth



Treat
everything as
code



Operations
through Git
workflows

Benefits of GitOps







- Collaboration
- Visibility & auditing
- Security & reliability
- Provisioning & deployment

Team Topologies

It's not only a tool, but an organisation

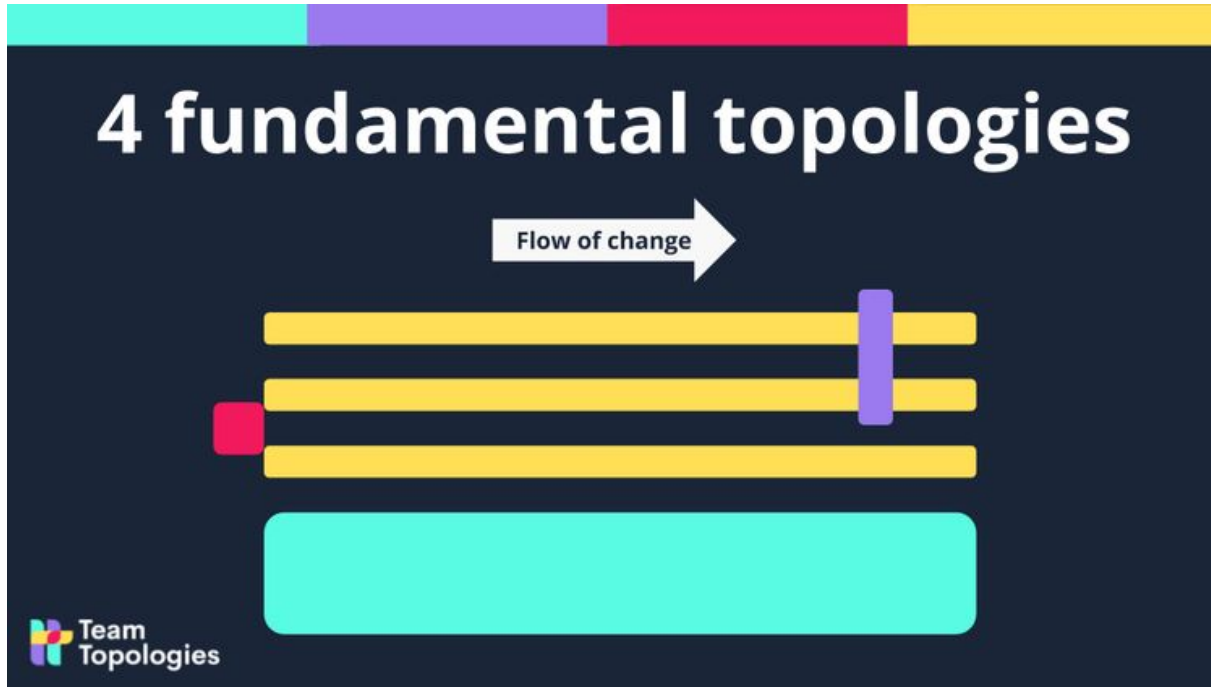


4 fundamental topologies

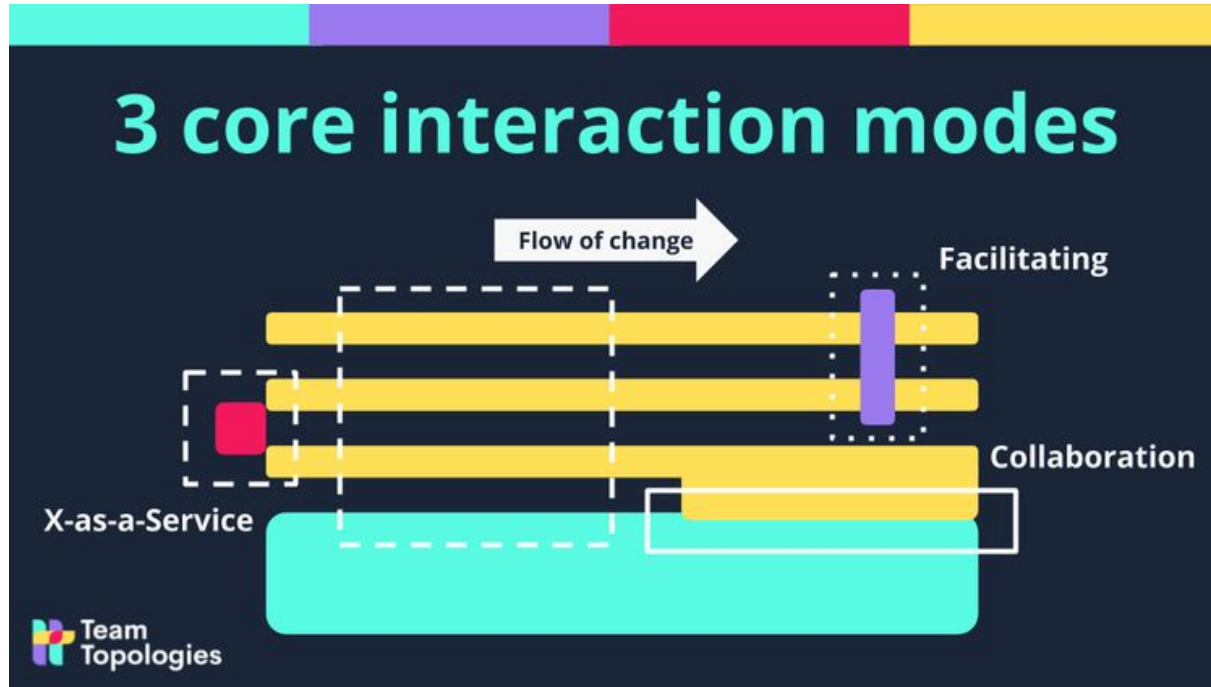
-  Stream-aligned team
-  Enabling team
-  Complicated Subsystem team
-  Platform team



<https://teampologies.com/>



<https://teampologies.com/>



<https://teampologies.com/>

Principles of Platform Engineering

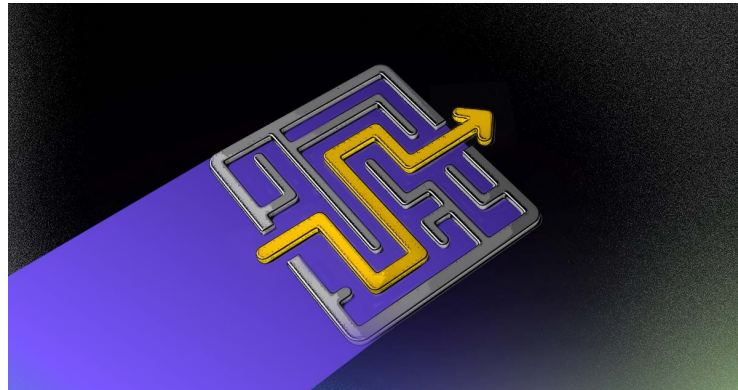
To make it work



Paving golden paths



Platform engineering is about binding process and tools into a paved road. Rather than letting everybody operate everything and having to understand the entire toolchain to do so, platform engineers provide the glue to bind everything into a consistent self-service experience.



Clear mission and role



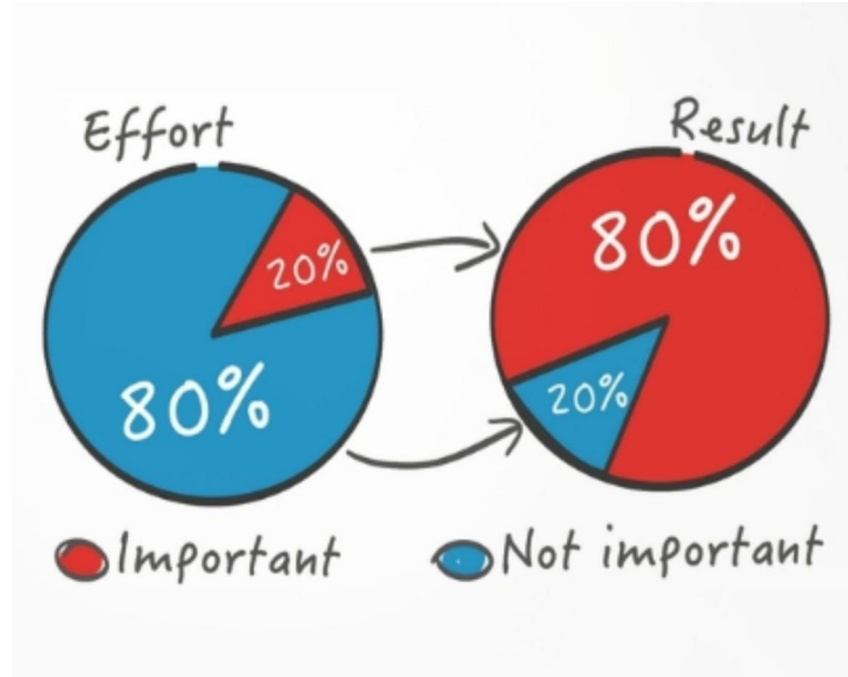
Platform as a Product



Work Types

Type	Output	Planning	Goal	Approach
Manufacturing			<ul style="list-style-type: none">• Maximise efficiency• Commodification	<ul style="list-style-type: none">• Mass production• Precise Specifications• Control Variation
Construction			<ul style="list-style-type: none">• Compromise between cost, time, scope and quality.	<ul style="list-style-type: none">• Plan & Execute• Comprehensive Specifications• Control Change
Product Development			<ul style="list-style-type: none">• Maximise quality and features• Discard low value work	<ul style="list-style-type: none">• Iterative experimentation• Respond to feedback

Focus on common problems



Glue is valuable



Don't reinvent the wheel





Rémi Verchère ❄️

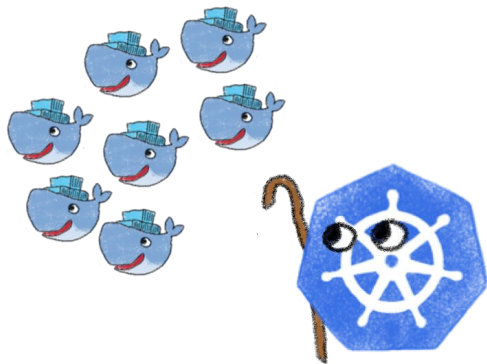
@rverchere

bash will still be used

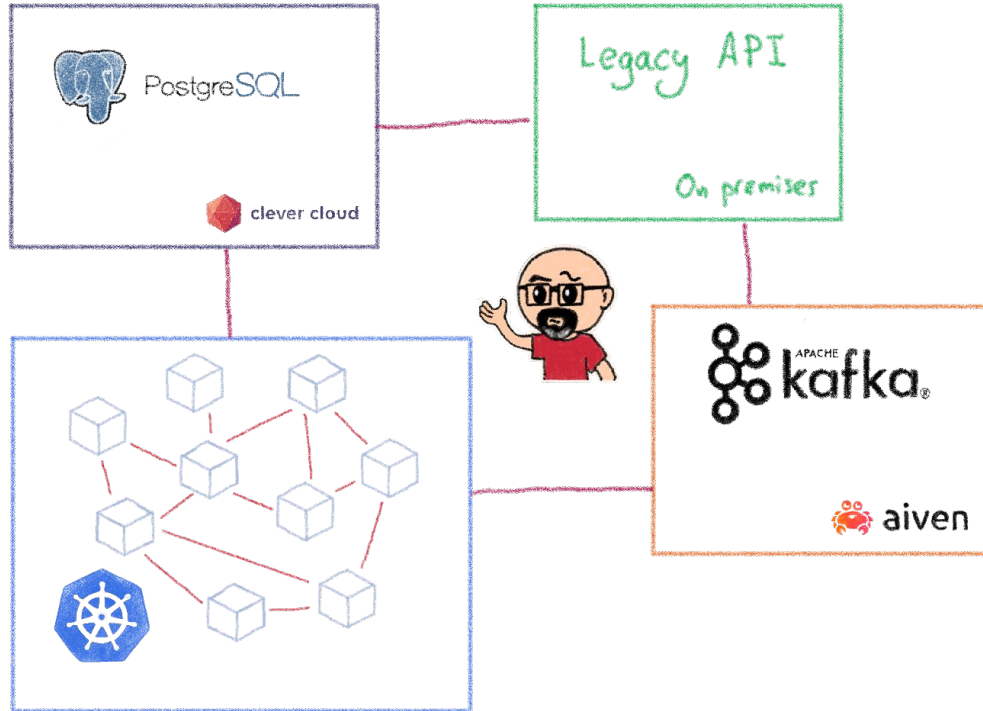
7:46 PM · Aug 8, 2023 · **290** Views

An IDP over Kubernetes

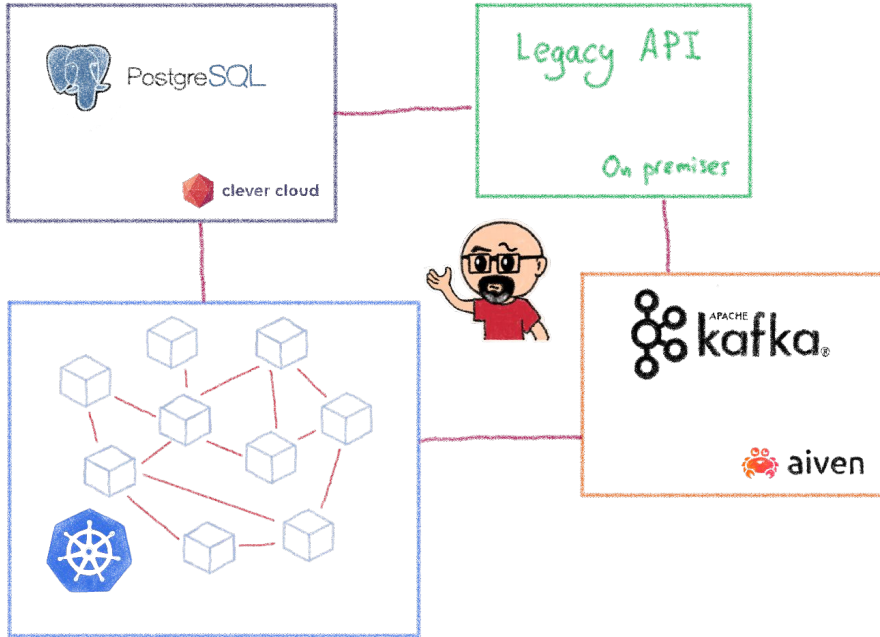
What could I use?




Don't put everything into Kubernetes



Operators simplify Kubernetes integration

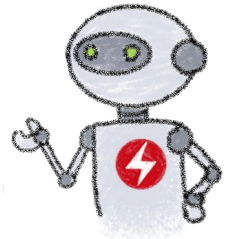


 OPERATOR



Human Operator

- Install
- Upgrade
- Lifecycle
- Insights
- Auto-pilot



Kubernetes Operator



Lots of available operators



OperatorHub.io


Search OperatorHub... Contribute ▾

Welcome to OperatorHub.io

OperatorHub.io is a new home for the Kubernetes community to share Operators. Find an existing Operator or list your own today.


CATEGORIES 359 ITEMS VIEW ▢ ▾ SORT A-Z ▾

- AI/Machine Learning
- Application Runtime
- Big Data
- Cloud Provider
- Database
- Developer Tools
- Drivers and plugins
- Integration & Delivery
- Logging & Tracing
- Modernization & Migration
- Monitoring
- Networking
- OpenShift Optional
- Security




Aerospike Kubernetes Operator
provided by Aerospike

The Aerospike Kubernetes Operator automates the




Airflow Helm Operator
provided by opdev

An experimental operator that installs Apache Airflow.




Aiven Operator
provided by aiven

Manage your <https://aiven.io> resources with Kubernetes.




Akka Cluster Operator
provided by Lightbend, Inc.


Run Akka Cluster applications on Kubernetes.




Altinity Operator for



Alvearie Imaging Ingestion



Anchore Engine Operator
provided by Anchore



Ansible Galaxy
provided by Galaxy

Hey DevBCN, operators ❤️ Java



The screenshot shows the homepage of the Java Operator SDK. The page has an orange header with a navigation menu containing links for HOME, DOCS, CODE OF CONDUCT, and RELEASES, along with icons for Discord and GitHub. Below the header is a large orange section with the Java logo and the text "[JAVA OPERATOR SDK]". Underneath this are three buttons: "GET STARTED", "CONTRIBUTE", and "DISCORD CHANNEL". The bottom section of the page is white and features the text "Sponsored by:" followed by the logos for Container Solutions and Red Hat.



So you have a bunch of operators...

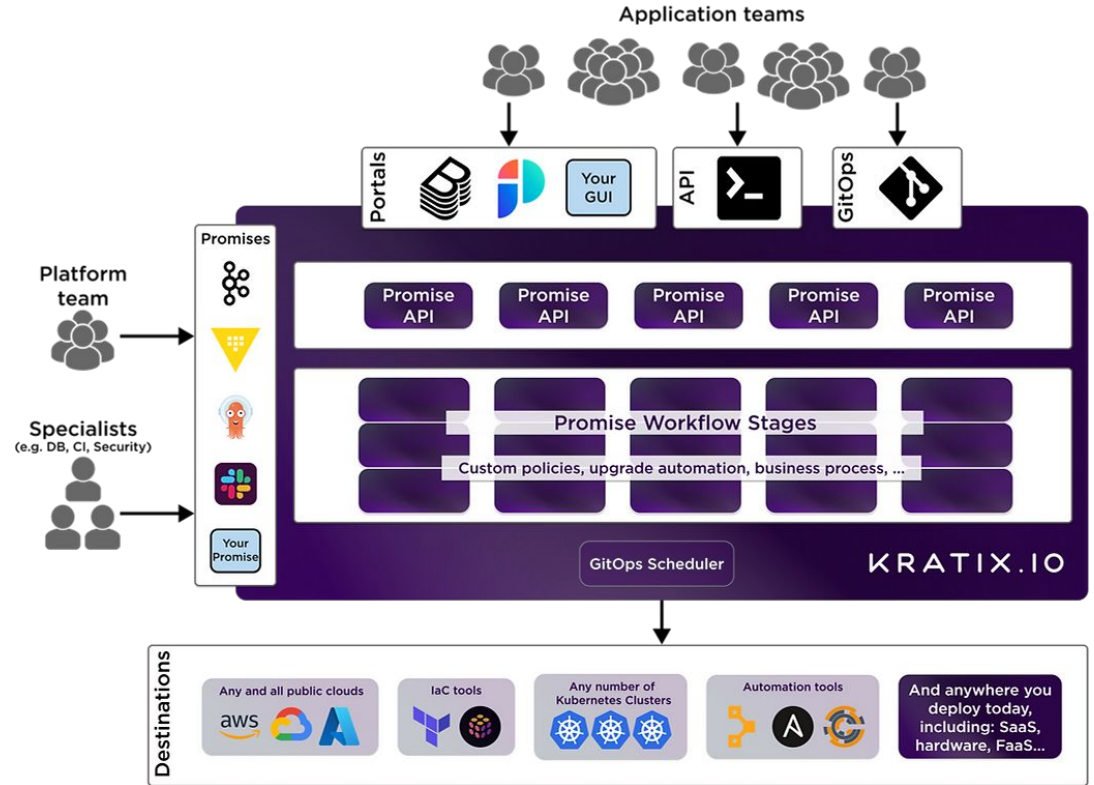


 Aerospike Kubernetes Operator provided by Aerospike The Aerospike Kubernetes Operator automates the...	 Airflow Helm Operator provided by airflow An experimental operator that installs Apache Airflow.	 Aiven Operator provided by aiven Manage your https://aiven.io resources with Kubernetes.	 Alkita Cluster Operator provided by Lightbend, Inc. Run Alkita Cluster applications on Kubernetes.	 Atlassian Operator for ClickHouse provided by Atlassian ClickHouse Operator manages full lifecycle of ClickHouse...	 Dapr Control Plane Operator provided by dapr.io Dapr Control Plane Operator	 DataDog Operator provided by DataDog DataDog provides a modern monitoring and analytics platform. Gather metrics...	 DataStax Kubernetes Operator for Apache Cassandra provided by DataStax Simple provisioning, flexible...	 DataTrucker IO provided by DataTrucker IO	 Debezium Operator provided by Debezium Authors An Operator for installing and managing Debezium
 Alibaba Imaging Ingestion Operator provided by Alibaba The Alibaba Imaging Ingestion provides a collection of...	 Anchore Engine Operator provided by Anchore Inc. Anchore Engine - container image scanning service for policy-based security. Learn...	 Anolis Galaxy provided by Galaxy Community Anolis Galaxy is Anolis's official hub for sharing...	 Apache Spark Operator provided by ramanalytics An operator for managing the Apache Spark clusters and intelligent applications...	 API Operator for Kubernetes provided by WSO2 API Operator provides a fully automated experience for...	 Dell Container Storage Modules provided by Dell Technologies Easily install and manage Dell's CSI Drivers and CSM.	 Dell CSI Operator provided by Dell Technologies	 Deployment Validation Operator provided by Red Hat The deployment validation operator	 Devfile Registry Operator provided by Red Hat Deploy and manage Devfile Registries on Kubernetes and OpenShift with the Devfile...	 dnext-operator provided by Merit Bridge dnext-operator
 API Testing provided by Insomnium API Testing Operator provides a fully automated experience for API Testing applications...	 APiCent provided by Red Hat APiCent is an API gateway built on top of NGINX. It is part of the Red Hat. Scales API...	 Apicurio Registry Operator provided by Apicurio Deploy and manage Apicurio Registry on Kubernetes.	 APM4Matic Operator Generate client SDKs and Interactive Documentation for your APIs in minutes.	 App Director provided by Randsol Enable Developer Self-Service to Setup and Manage Applications on Multiple...	 DNS Operator provided by Red Hat A Kubernetes Operator to manage the lifecycle of DNS resources	 druid-operator provided by Apache Druid Community druid-operator allows creating Apache Druid cluster...	 DynaTrace OneAgent provided by Dynatrace LLC	 DynaTrace Operator provided by Dynatrace LLC	 Eclipse Ditto provided by Jens Remann Eclipse Ditto provides a Digital Twin platform. A digital twin is a virtual, cloud-based...
 AppDynamics Operator for Kubernetes provided by AppDynamics LLC AppDynamics Operator to install AppDynamics Clou...	 Application Services Metering Operator provided by Red Hat Collect the core usage of products from the Appli...	 Appraxis CPS Operator provided by Appraxis, Inc The Appraxis CPS operator enables you to back up and restore your...	 Aqua Security Operator provided by Aqua Security, Inc. The Aqua Security Operator runs within a OpenShift cluster and provides a means to...	 ArangoDB provided by ArangoDB GmbH ArangoDB Kubernetes Operator	 Eclipse Hawkbit provided by Jens Reinmann Eclipse hawkbit is a firmware update platform.	 ECR Secret Operator provided by MOBB ECR Secret Operator	 EDB Postgres for Kubernetes provided by EnterpriseDB Corporation Operator to manage Post...	 EDP Keycloak Operator provided by EPM Delivery Platform An Operator for managing Keycloak.	 EDP Nexus Operator provided by EPM Delivery Platform An Operator for managing Nexus entities.
 Argo CD provided by Argo CD Community Argo CD is a declarative, GitOps continuous delivery...	 Argo CD Operator (Helm) provided by OpenSource Zone Declarative Continuous Delivery following GitOps.	 Astra Trident provided by NetApp, Inc. Trident Operator, to manage Astra Trident installations	 AtlasMap Operator provided by AtlasMap AtlasMap is a data mapping solution with an interactive web-based user interface...	 AuthInfo Operator provided by RedHat	 EDP Sensor Operator provided by EPM Delivery Platform An Operator for managing Sensor entities.	 eG Innovations Universal Agent Operator provided by eG Innovations	 Elasticsearch (ECK) Operator provided by Elastic Run Elasticsearch, Kibana, APM Server, Beats, Emb...	 Elasticsearch Index Operator provided by IBM An operator for managing index installations...	 Elasticsearch Phenix Operator provided by Carrefour Manage elasticsearch indices, templates lifecycle...



Too many options again...

Use a Platform Engineering framework



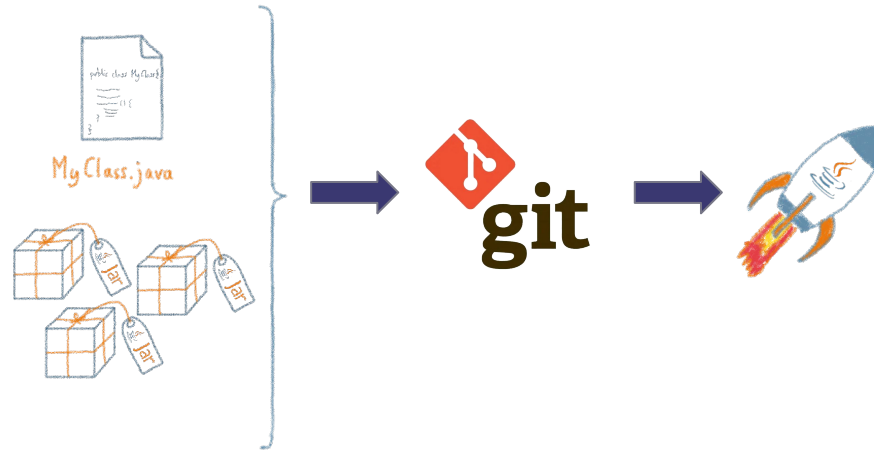
Set-up a robust CI/CD/GitOps pipeline



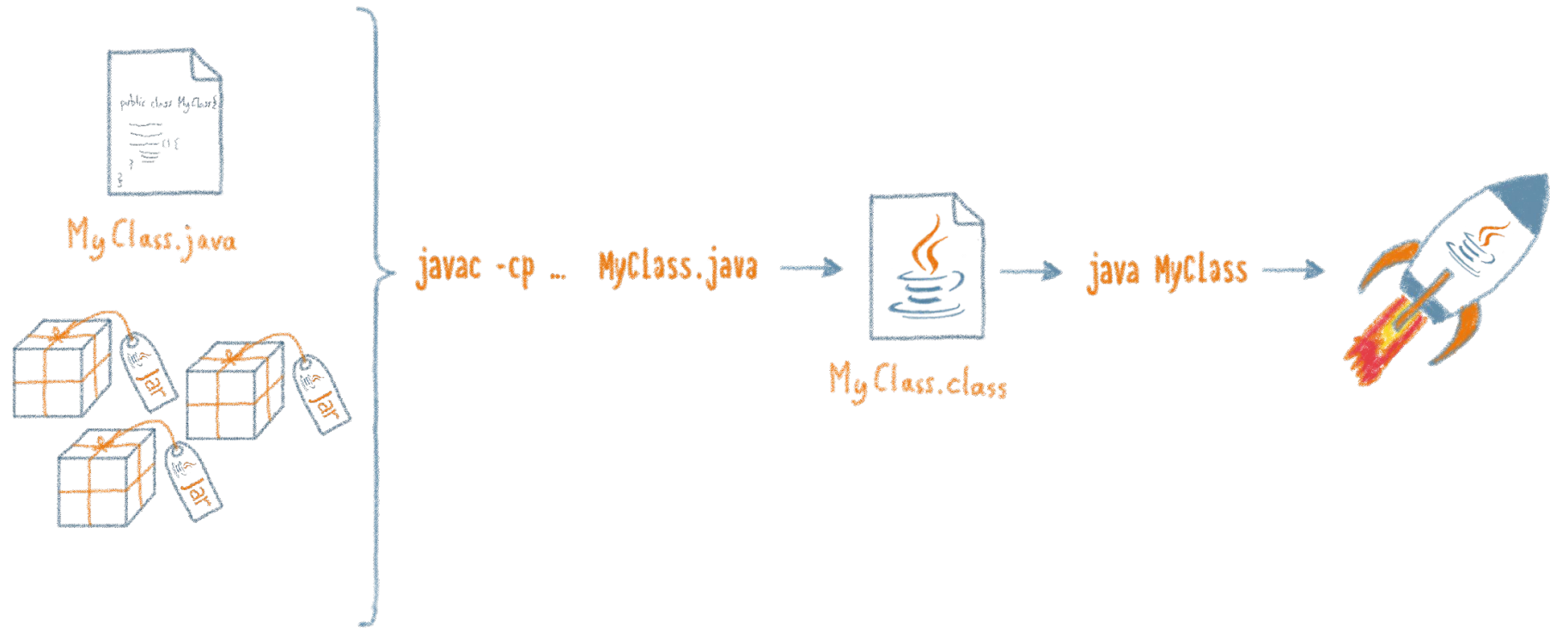
A screenshot of the Argo CD web interface. The top navigation bar includes "Applications / argocd-dev" and "APPLICATION DETAILS TREE". Below this are several buttons: "APP DETAILS", "APP DIFF", "SYNC", "SYNC STATUS", "HISTORY AND ROLLBACK", "DELETE", and "REFRESH". The main content area shows the application's health status as "Missing" (yellow icon) and "OutOfSync From 3.33.2 (3.33.2)" (yellow icon). The "CURRENT SYNC STATUS" is "OutOfSync From 3.33.2 (3.33.2)" and the "LAST SYNC RESULT" is "Sync OK" (green icon) "To 3.33.2", which succeeded a minute ago. The interface displays a dependency graph for the application, starting with the "argocd-dev" application (9 minutes) and branching into several components: "argocd-dex-server" (8 minutes), "argocd-server" (8 minutes), "argocd-dev-application-controller" (1 minute), "argocd-dev-repo-server" (1 minute), and "argocd-dev-server" (1 minute). Each component is further broken down into its underlying Kubernetes resources, such as "secret", "rs", and "pod". A search bar at the top left of the graph shows "90%".

An IDP without Kubernetes

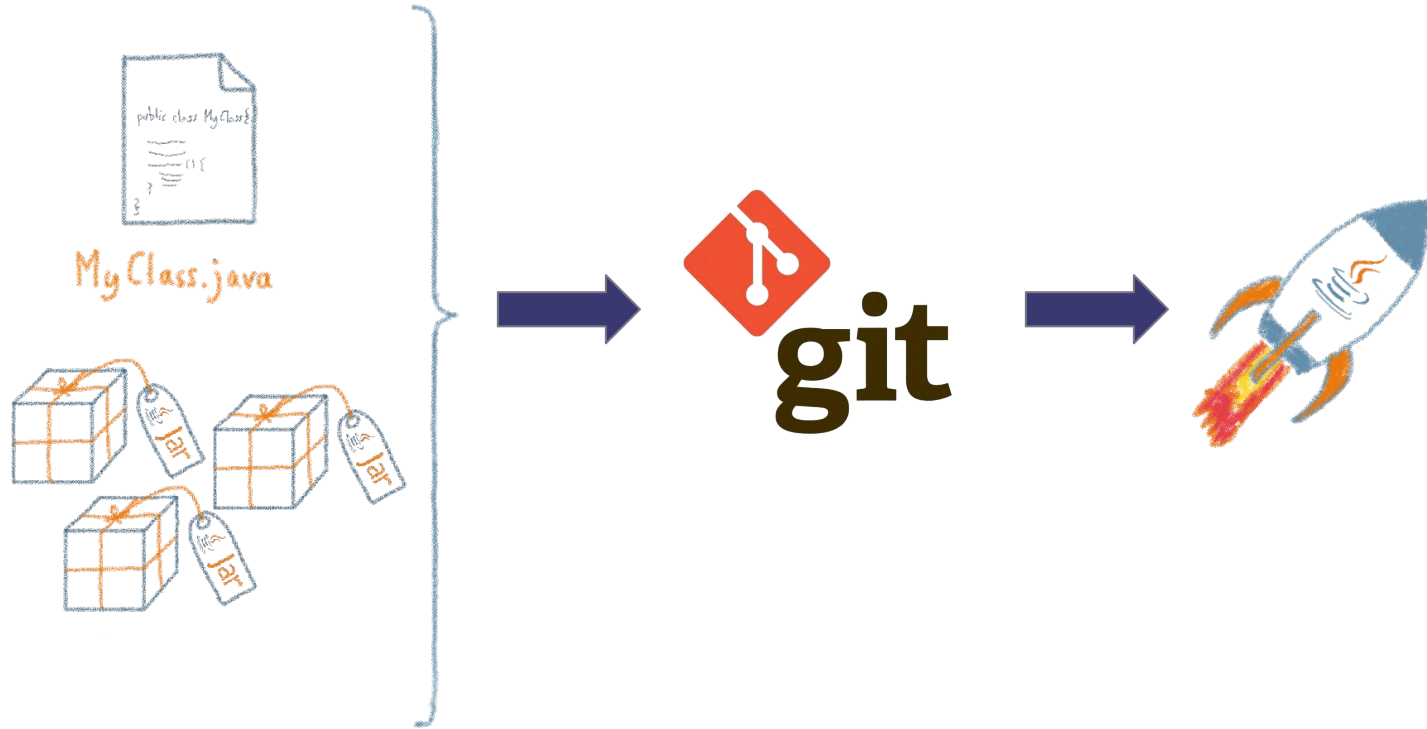
There is a life outside K8s...



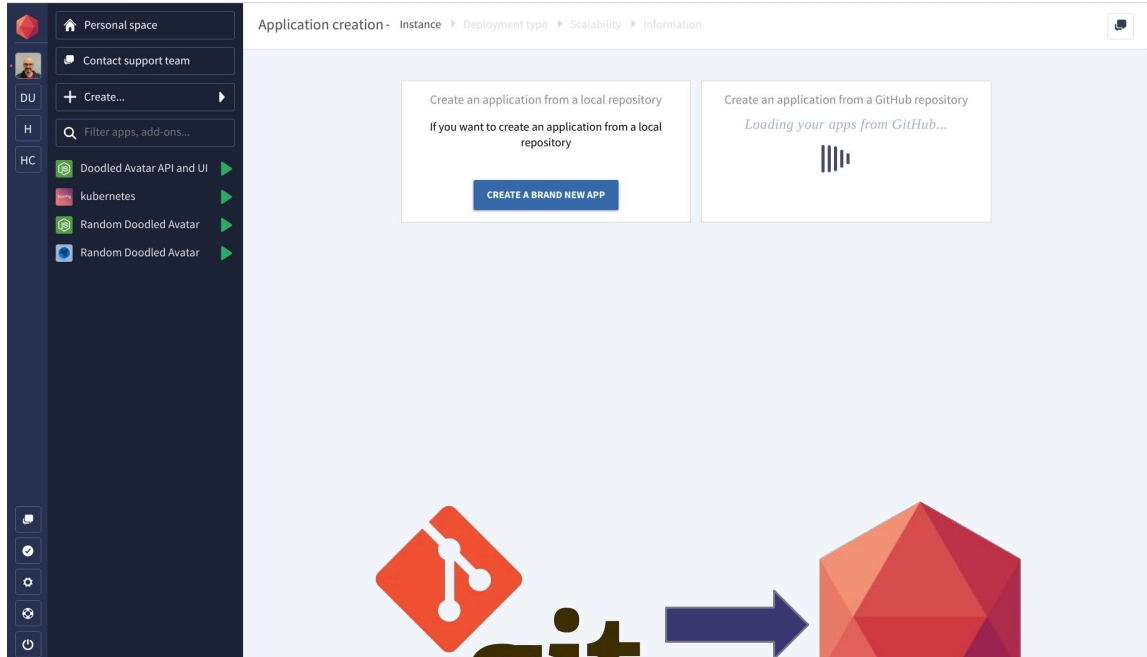
What if developers only developed?



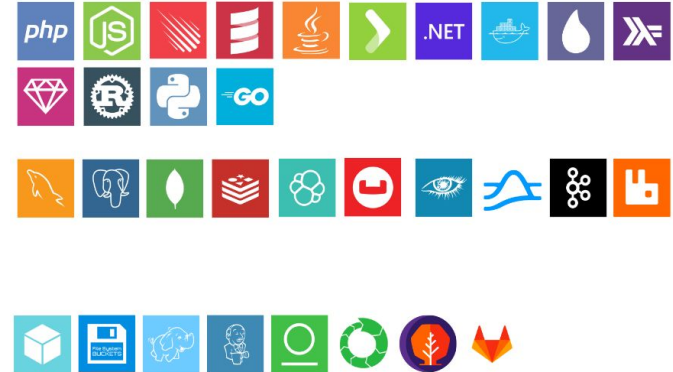
PaaS as cornerstone of a dev-centered IDP



Clever Cloud



clever cloud



Some Links to go further



- [There Is No Such Thing as a DevOps Engineer](#)
- [DevOps Topologies](#)
- [What is Platform Engineering](#)
- [Team Topologies](#)
- [Kratix](#)
- [Aiven](#)
- [Clever Cloud](#)

