



Devops

-

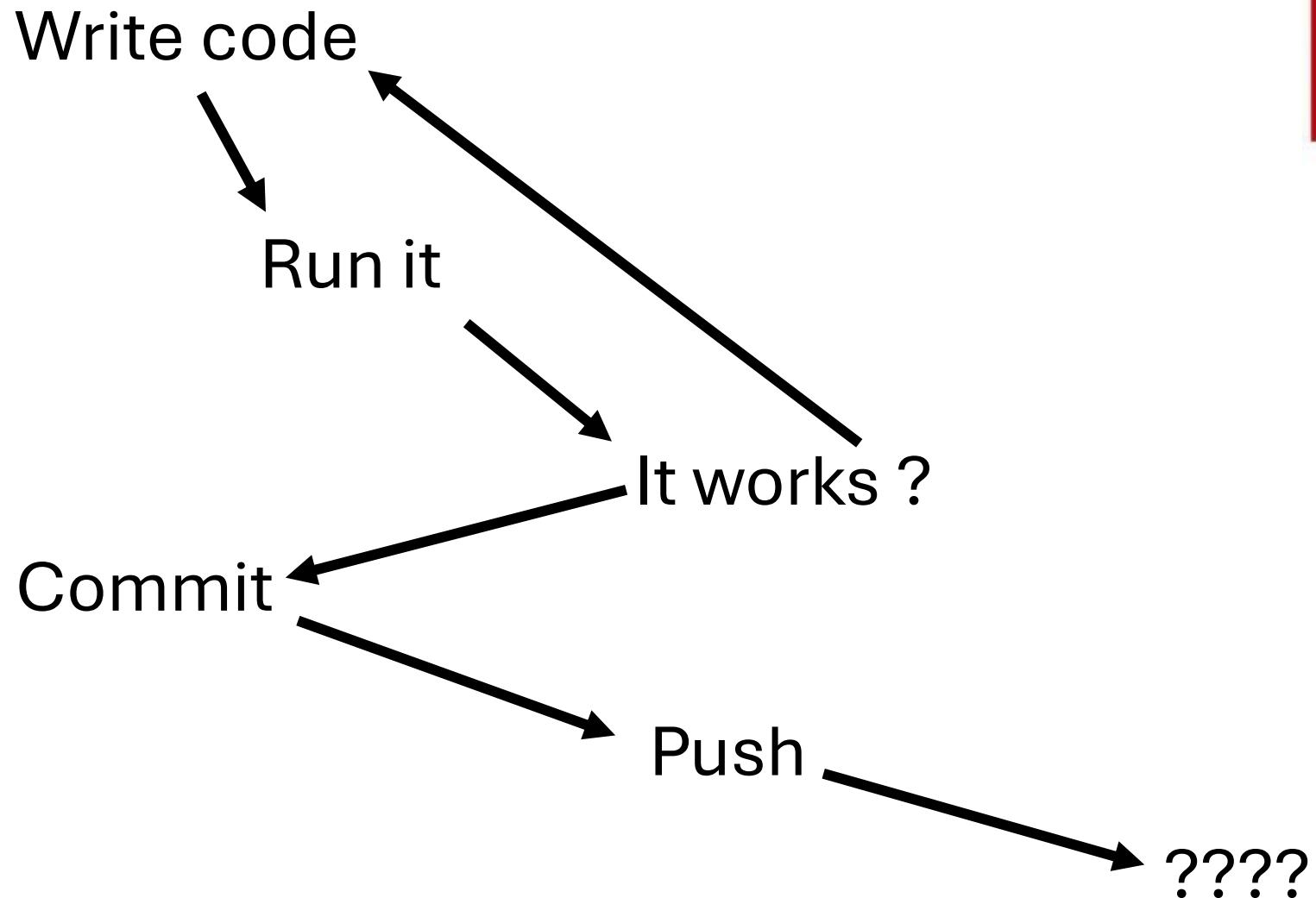
Foundations

Nassim Bounouas - 2026

Course objectives

- Understand DevOps as a culture
- Build trust in the release process
- Observe and operate a production system

What is it to be a developer?



1. git commit



2. git push



3. git out!

The old world : Dev vs Ops

Development	Operations
Write and change code	Deploy and run systems
Focus on new features	Focus on stability
Works locally / dev environment	Works in production env
Frequent changes	Avoid change
Handover the software	Receive and maintain the software

The wall of confusion



Why does it fail ?

- Manual deployment
- Rare releases
- Big risky changes
- Slow feedback

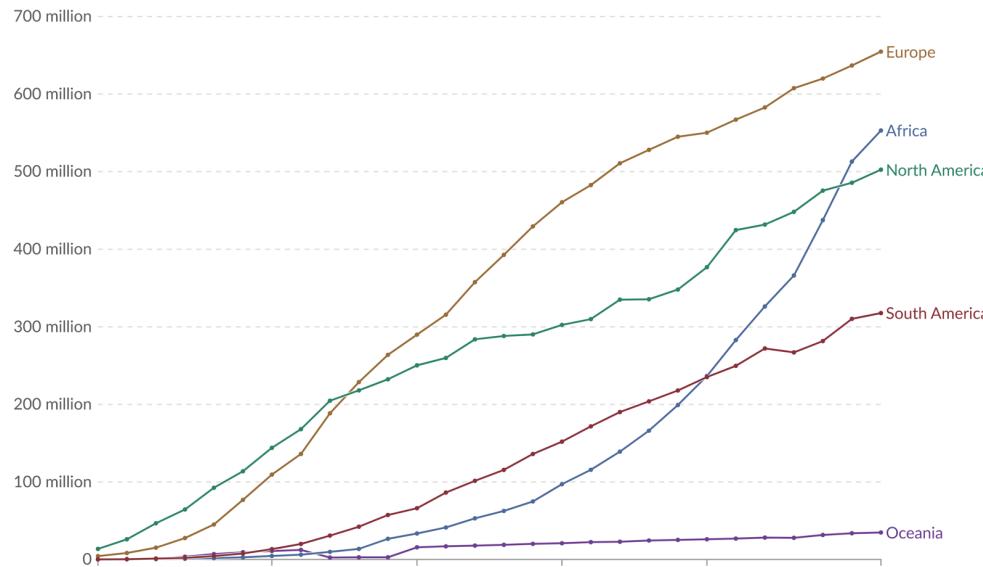


<https://www.bbc.co.uk/newsround/articles/czk01zj8mvzo>

The need for a new approach

Number of people using the Internet

Number of people who used the Internet¹ in the last three months.



Data source: International Telecommunication Union (via World Bank)

OurWorldInData.org/internet | CC BY

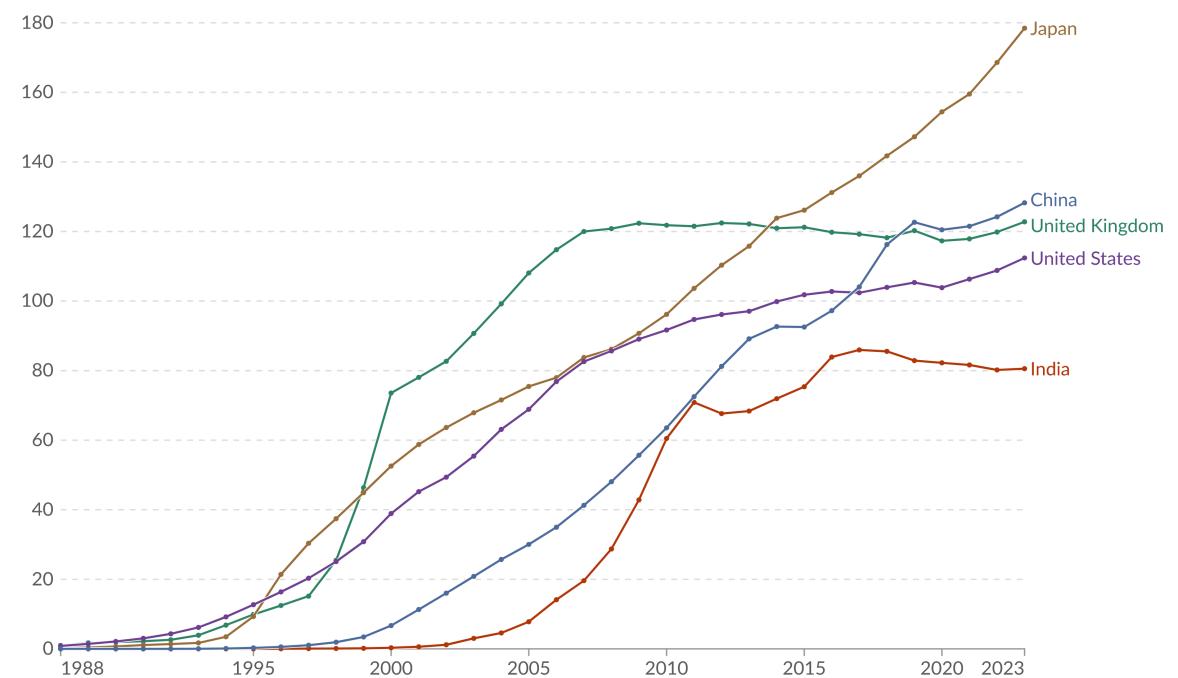
1. Internet user The International Telecommunication Union defines an Internet user as anyone who has accessed the Internet from any location in the last three months.

This can be from any type of device, including a computer, mobile phone, personal digital assistant, games machine, digital TV, and other technological devices.

<https://ourworldindata.org/grapher/number-of-internet-users>

Mobile phone subscriptions per 100 people, 1988 to 2023

This number can get over 100 when the average person has more than one subscription to a mobile service.



Data source: International Telecommunication Union (ITU), via World Bank (2025)

OurWorldInData.org/technological-change | CC BY

<https://ourworldindata.org/grapher/mobile-cellular-subscriptions-per-100-people?tab=line&time=1988..2023>

Birth of DevOps

- 2003 – Site Reliability Engineer (@Google)
- 2008 – Andrew Clay & Patrick Debois – Agile Infrastructure
- 2009 – First DevopsDays

"DevOps is the union of people, process, and products to enable continuous delivery of value to our end users."

Donovan Brown

2009 - "10+ deploys per day" (Flickr) <https://www.youtube.com/watch?v=LdOe18KhtT4>

2019 - "What is DevOps?" (Donovan Brown - Microsoft)- <https://www.youtube.com/watch?v=WW6x0jIPpr0&t=20s>

2022 - "The Rise and Fall of DevOps with Dana and Bryan Finster" - https://www.youtube.com/watch?v=PQXDVR6h_xl

DevOps is not a role

Welcome to the Jungle Trouver un job Trouver une entreprise Média Cherchez un job, une entreprise

Offres d'emploi de DevOps

Retrouvez toutes les offres d'emploi disponibles en France.

OFFRES D'EMPLOI > EMPLOI INFORMATIQUE > EMPLOI DEVOPS

Offres d'emploi Devops

DevOps Cloud Azure
■ SHAPE IT
ESN verte et sociale pour un IT durable
CDI, Lille, Télétravail fréquent, Logiciels, IT / Digital, 105 collab.
avant-hier

Stage DevOps Junior (F/H)
GROUPE SII
Conseil en technologies pour la transformation digitale
Stage, Nantes, Télétravail, Logiciels, Intelligence artificielle / Machine learning

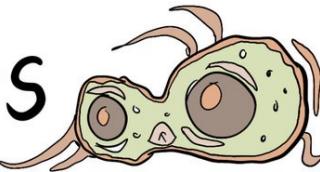
EVOLUTION OF OPERATIONS

OPS



- PRIMORDIAL, PROTOZOIC
- BORN IN THE SWAMPS OF PERL
- OPERATES IN A SINGLE-CELL SILO
- SURPRISINGLY RESILIENT

DEVOPS



- A CROSS-FUNCTIONAL MARVEL
- VASTLY INCREASED AGILITY
- SECRETLY JUST A BUNCH OF SINGLE CELLS THAT HAVE LEARNED NOT TO KILL EACH OTHER

DEVSECOPS



- MORE ADVANCED, MORE PARANOID
- SECURITY IS AUTOMATED RIGHT INTO ITS DNA
- KNOWS THAT SHARED RESPONSIBILITY IS THE ONLY ESCAPE FROM FOSSILIZATION

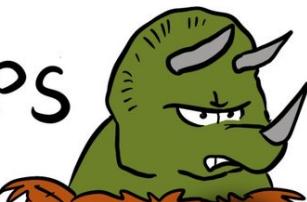
DEVSECMLOPS



- WHAT EVEN IS THIS?
- IS IT A FISH WITH FEET?
- WE SHOULD PROBABLY LEAVE IT ALONE FOR A FEW MILLION YEARS AND SEE WHAT HAPPENS

TRICERATOPS

@acloudguru



- DOES NOT CARE ABOUT YOUR ORG STRUCTURE
- VULNERABLE ONLY TO DIRECT METEOR STRIKES
- WHAT WERE WE TALKING ABOUT, AGAIN?

LinkedIn

Devops Engineer

Lyon, Auvergne-Rhône-Alpes

40 km

N'importe quand

Entreprise

Type de contrat

Niveau d'exp

cas de nouvelles offres d'emploi :
en, Auvergne-Rhône-Alpes, France.

pour créer une alerte Emploi

Devops Engineer dans le lieu sélectionné
es, France)

ps Kubernetes

premiers candidats

es, France

premiers candidats

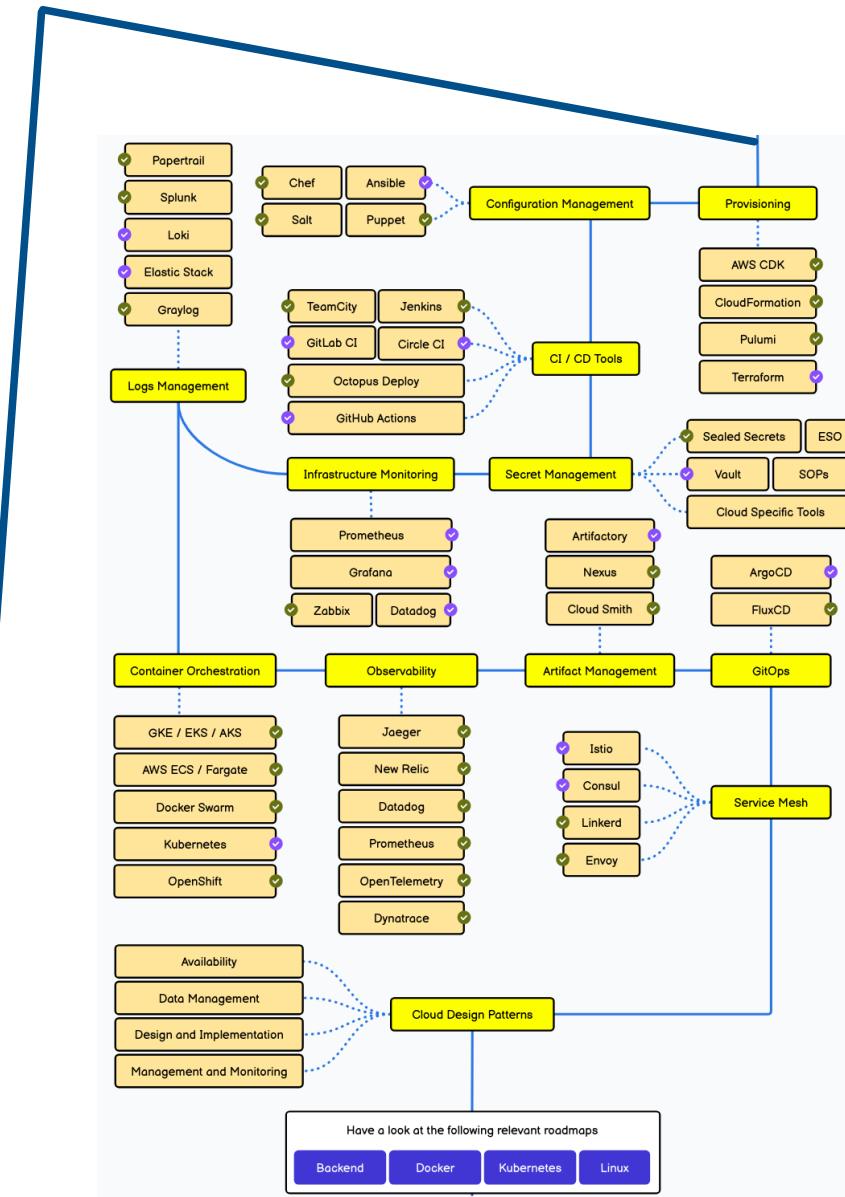
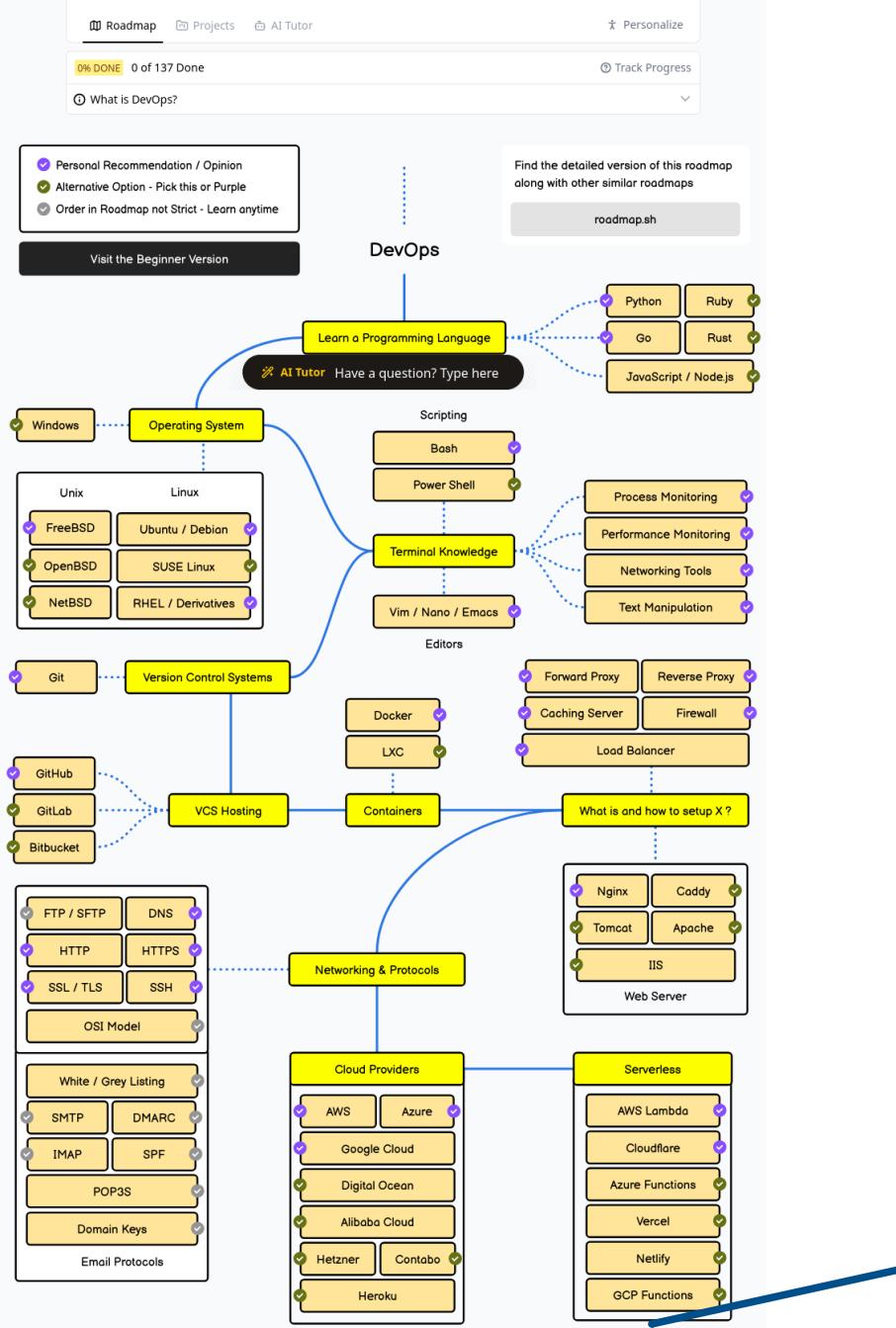
Dps

Auvergne-Rhône-Alpes

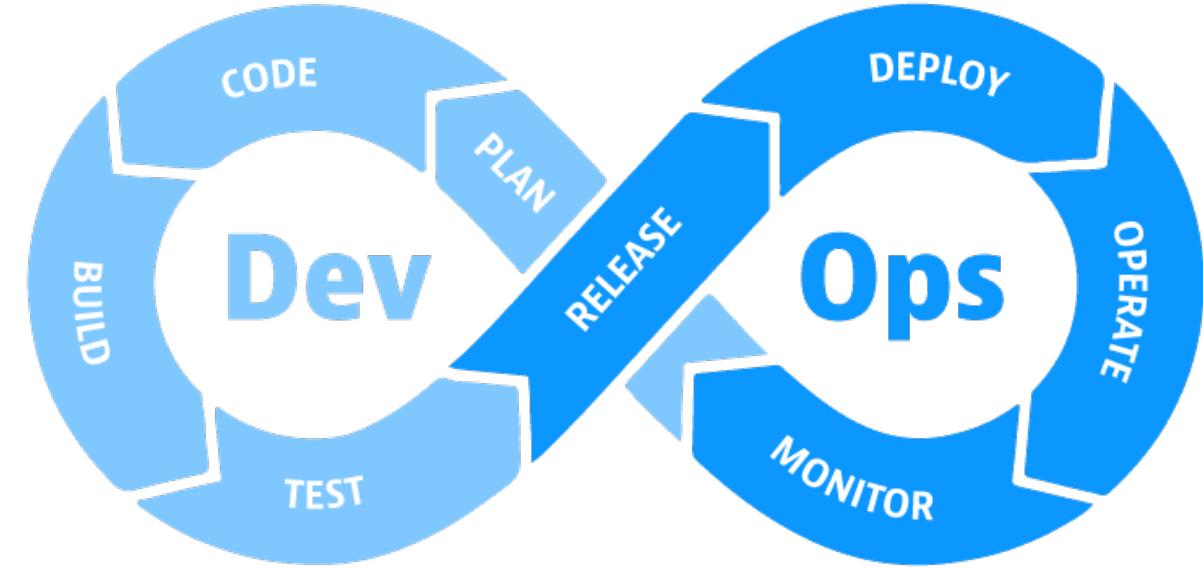
METHODOLOGY

DevOps Roadmap

Step by step guide for DevOps, SRE or any other Operations Role in 2026



DevOps loop



Plan: Define goals, requirements, and tasks to align development work with business and user needs.

Code: Write and manage source code implementing the planned features and fixes.

Build: Compile and package the code into executable artifacts in a repeatable, automated way.

Test: Automatically verify that the software works correctly and meets quality standards.

Release: Approve and version a build so it is ready to be delivered to production environments.

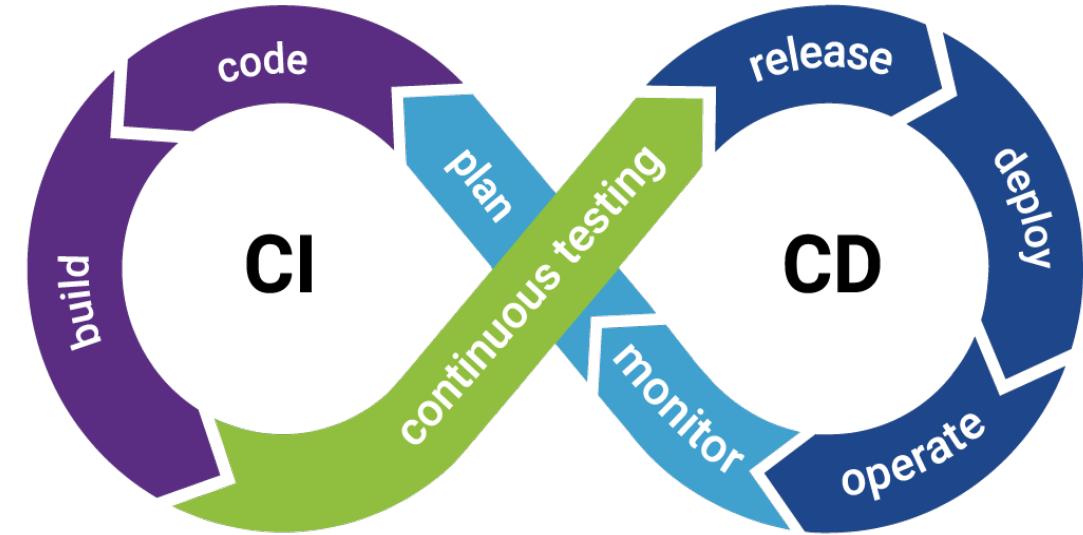
Deploy: Roll out the released version to target environments in a controlled and automated manner.

Operate: Run and maintain the application in production, ensuring availability and performance.

Monitor: Continuously observe metrics, logs, and user behavior to detect issues and guide improvements.

Integrate, Deliver and Deploy

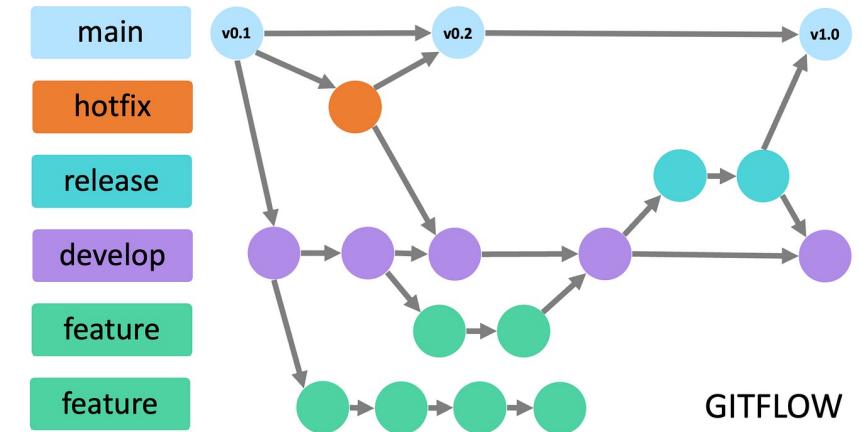
- Continuous Integration
 - Frequent changes
 - Automatic build and test
 - Keep the codebase healthy
- Continuous Delivery
 - Prepare for release
 - Can be deployed at any time manually
 - Artifacts are versioned, packaged and stored
- Continuous Deployment
 - Deploy to production
 - Reach the end user
 - Handling of failures



Branching and Releases: Controlling the Flow of Change

- Branches
 - Isolate work and reduce risk
 - Enable parallel development
 - Pull requests as a quality gate

- Releases
 - Define an official version of the code
 - Create reproducible, traceable artifacts
 - Mark what can be delivered to users



[The ultimate guide to git branching strategies](#)

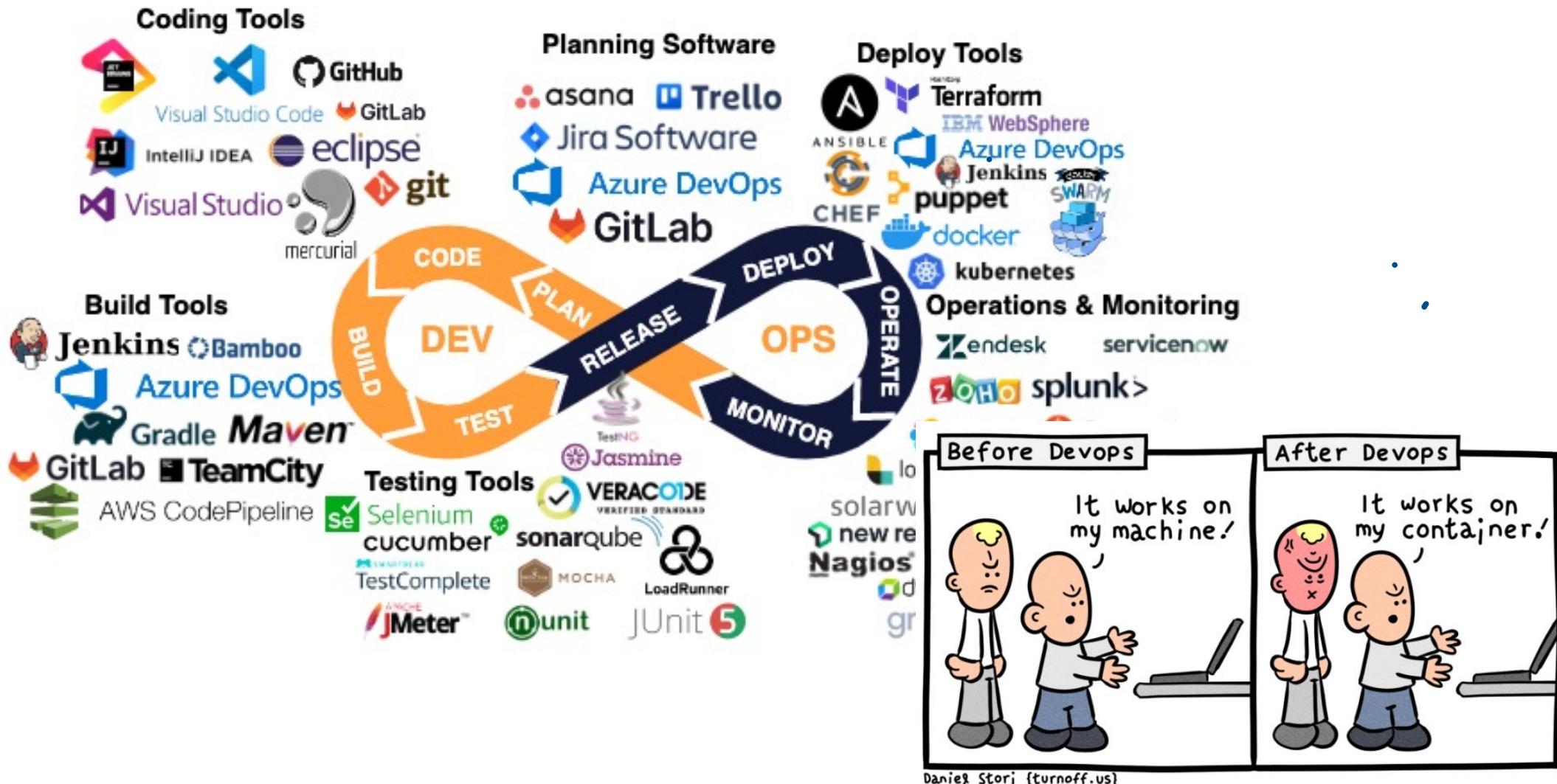
Versioning: Naming and Controlling Software Evolution

- Identify a precise state of the software
- Make releases reproducible
- Enable rollback and debugging



<https://pixabay.com/photos/cow-farm-tag-ear-tag-grass-5971963/>

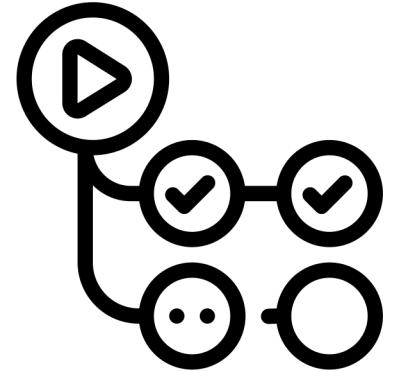
The overwhelming toolbox



What do we expect from you before next lecture?

- Rely on a well-argued branching strategy (see TODO devops)
 - How do you implement the features ?
 - When and what do you test ?
 - How often and how do you release ?
- Implement an automated run of tests (22/01)
- Implement an automatic log of the changes you bring (29/01 or 02/02)
 - Pull-request are mandatory
 - Code-review
 - Versioning
- **EXPERIMENT**

The base toolbox



- Github actions : <https://docs.github.com/en/actions>
- Release-it : <https://github.com/release-it/release-it>
- Action-semantic-pull-request : <https://github.com/amannn/action-semantic-pull-request>
- Scripts in suitable language : bash, python, typescript...

