CI/CD Pipelines for Microservices *Best Practices*

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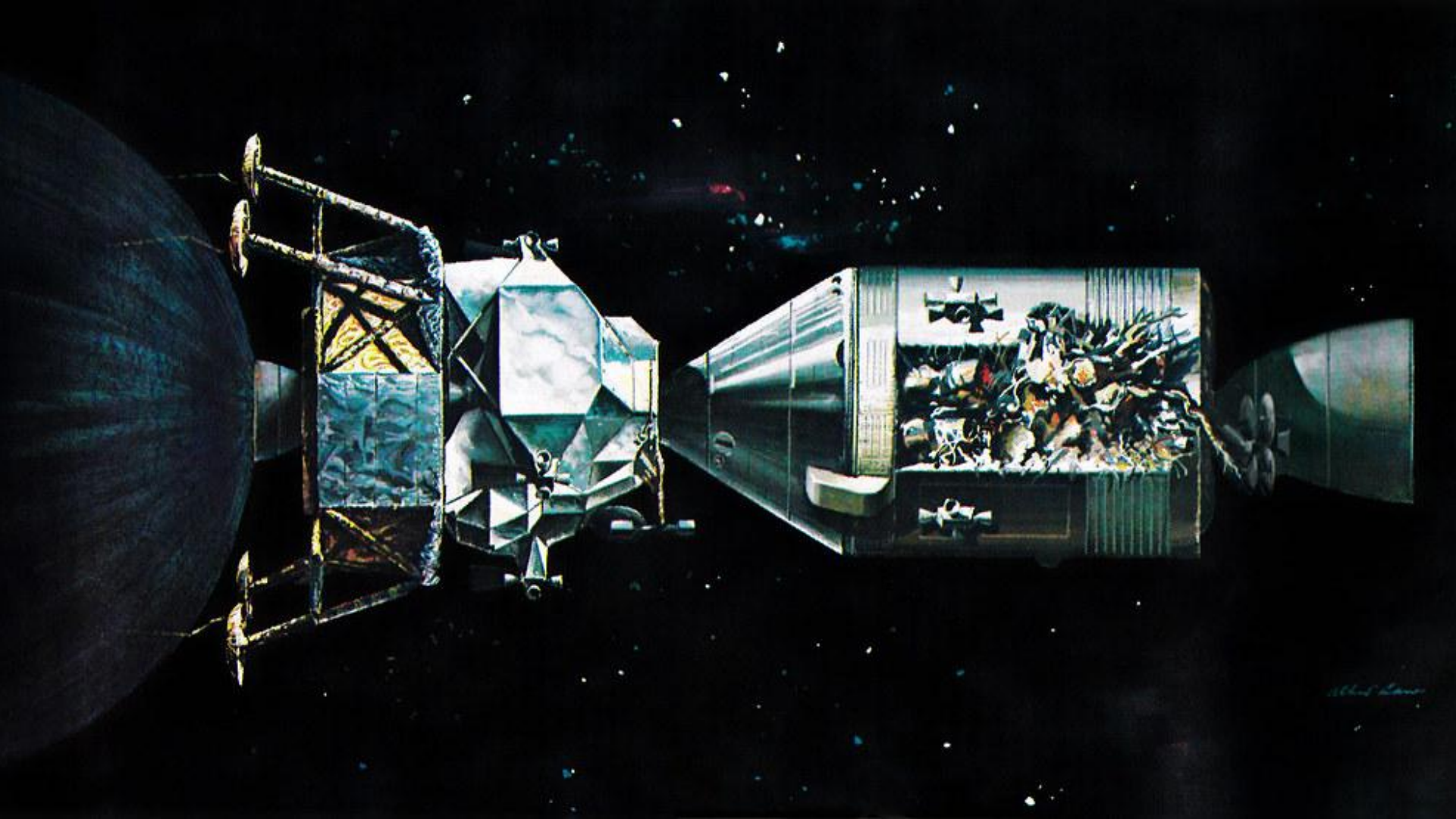
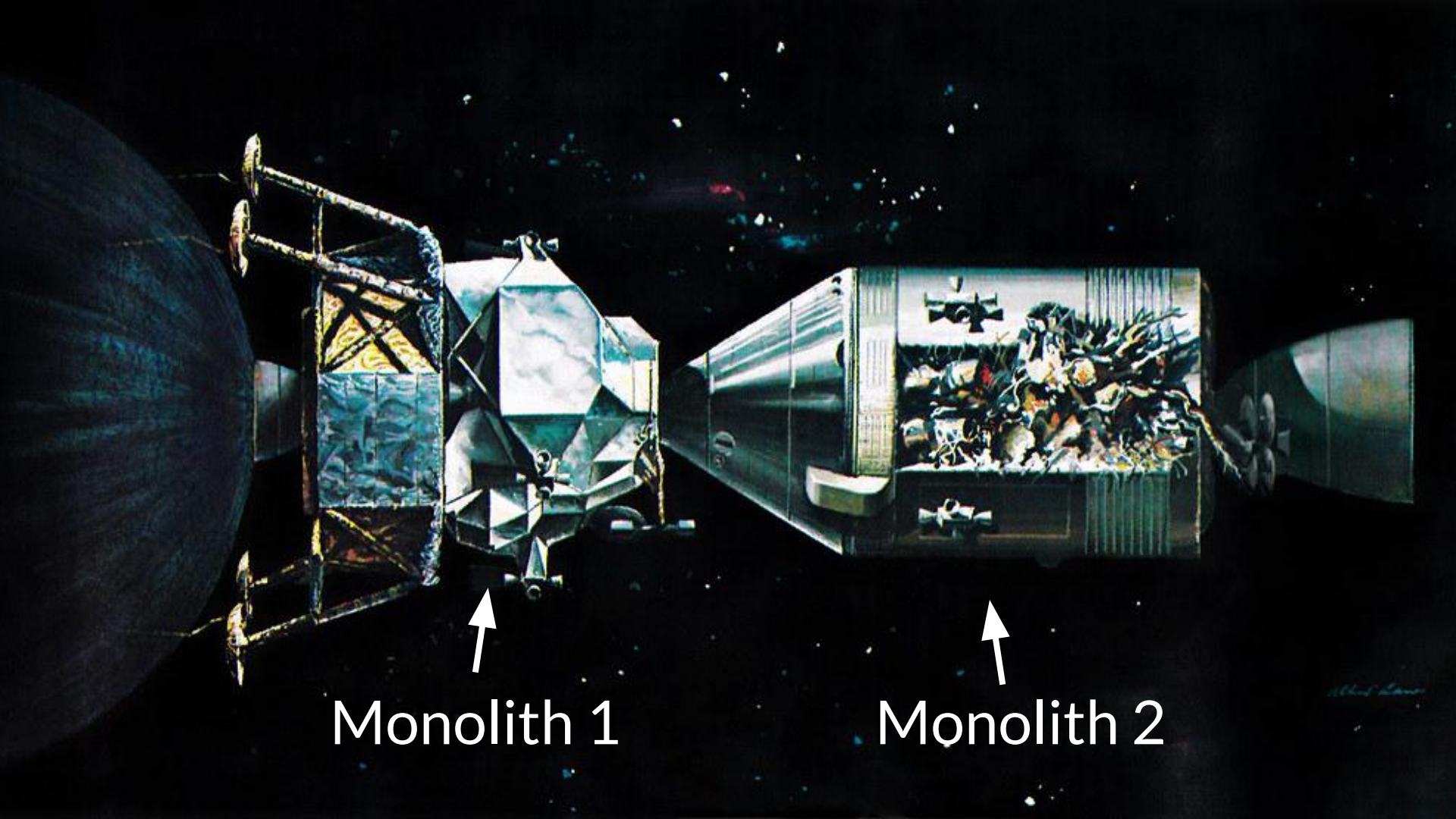
@todaywasawesome

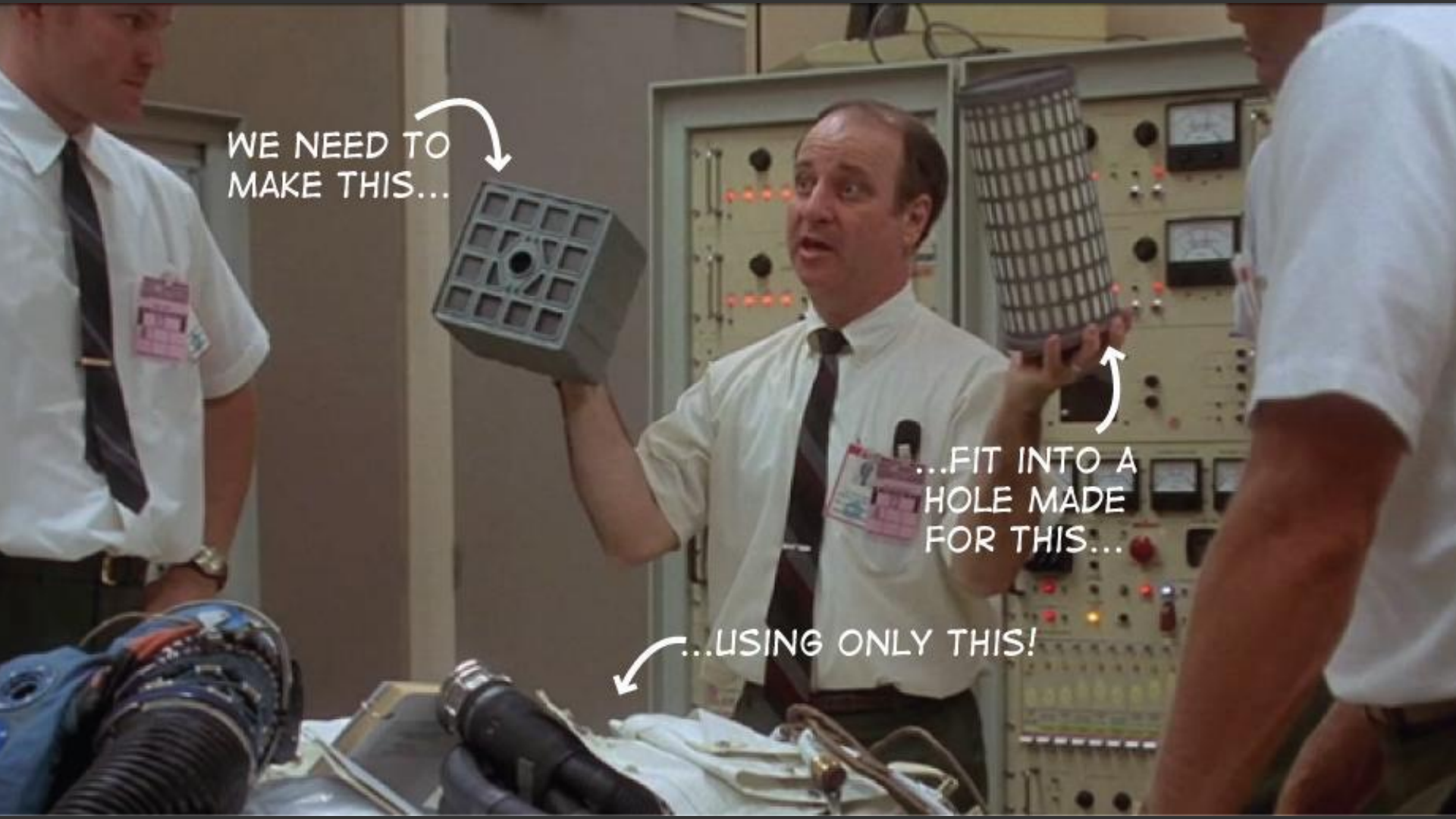
Agenda

1. Why microservices
2. How Expedia approached microservice CI/CD
3. How we do it at Codefresh

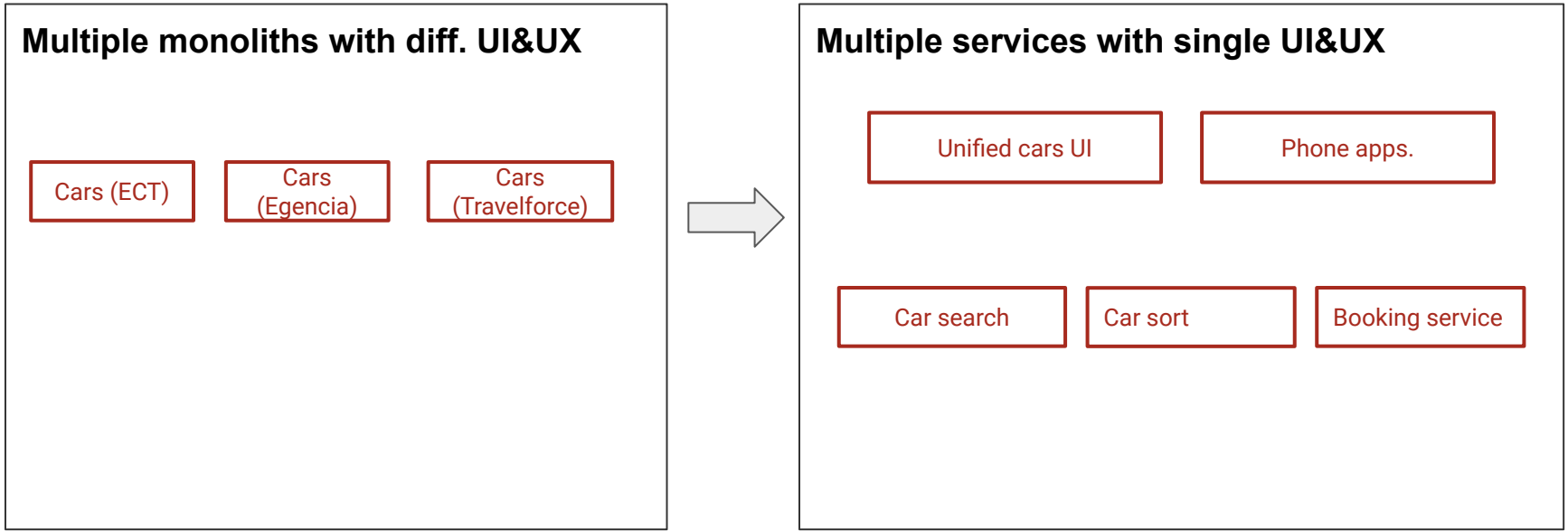
Why Microservices?




Monolith 1
Monolith 2


WE NEED TO MAKE THIS...
...FIT INTO A HOLE MADE FOR THIS...
...USING ONLY THIS!

Expedia corporate travel re-architecture



Moving to Microservices at Expedia

Approach

- Consolidate code bases and
- Build shared libraries for global platform. Ex:
  - Logging service, monitoring service
- Rely on manual integration testing
- Standardize CI/CD pipelines
- Use Maven for modularity
- Migrate to cloud from on-prem

Issues faced

- Geographically distributed
- Tools consolidation was hard
- Too many pipelines as microservices grew.
  (100 pipelines → 1000+)
- Pipelines not modular or re-usable
- Jenkins master-slave issues
- Copypasta causing bad patterns
- Central team could not keep up
- Plugin upgrade was a nightmare

Moving to Microservices at Expedia

Lessons learned and Recommendations

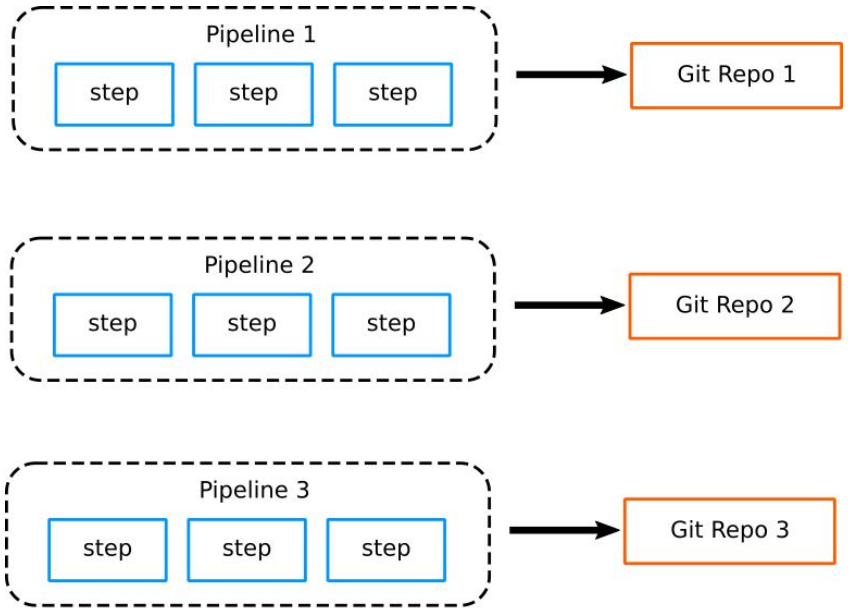
- CI/CD templates should have been prioritized higher than “business needs”
- Bootstrapping new projects should have been externalized from the microservice and adding a new microservice should have full pipeline setup once a repo is created
- A modular pipeline approach would ease the pain caused by different versions
- Reusability in CI/CD platform is critical

Organizing pipelines for monolithic applications

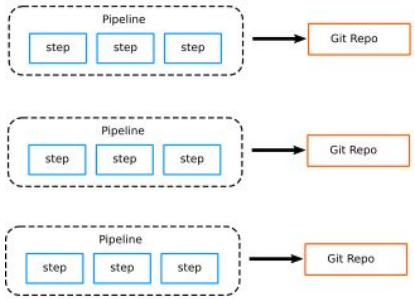
Single pipeline per project

Can be complex/difficult to be maintain

Usually led by a single team (anti-devops)

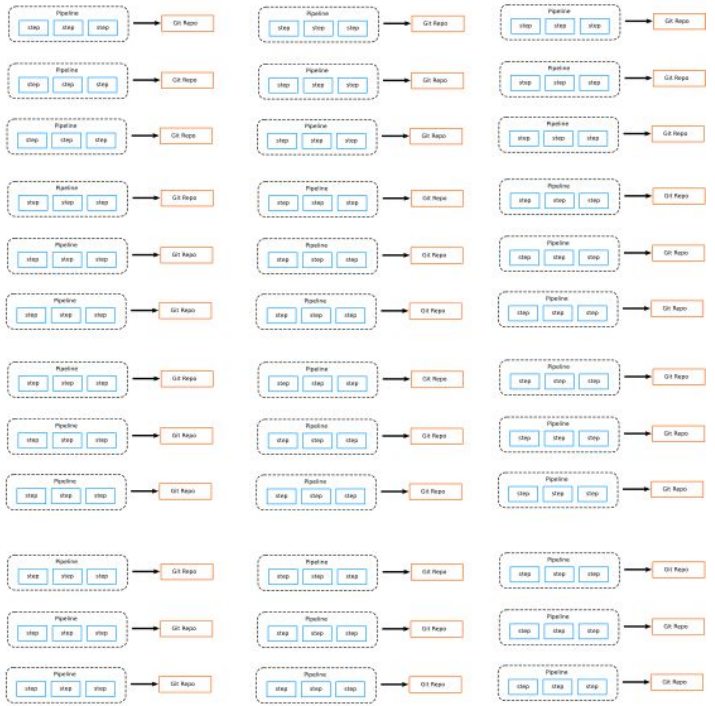


Scalability issues with microservice pipelines



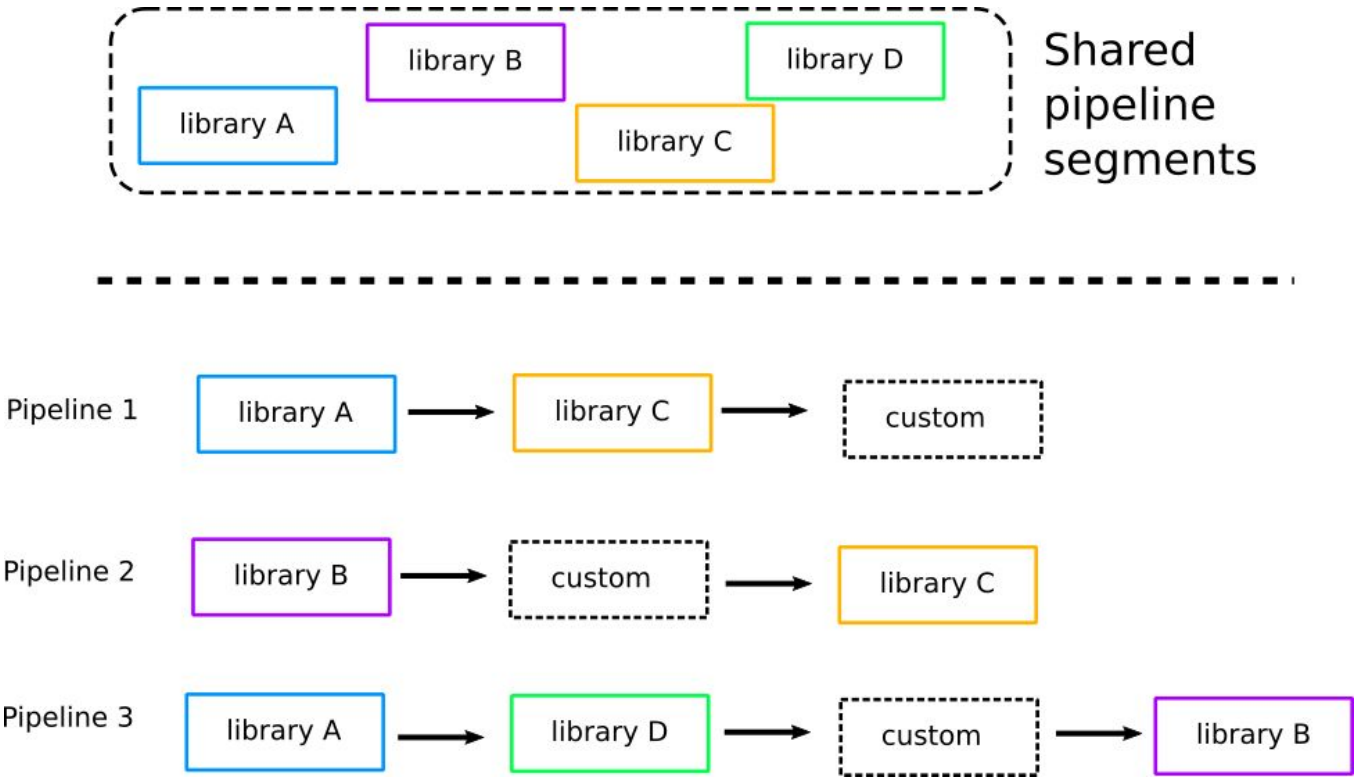
3 monolithic applications

Does this look like a plan??



Each application split to 4 microservices

Shared libraries are not the solution.



Organizing pipelines for monolithic applications

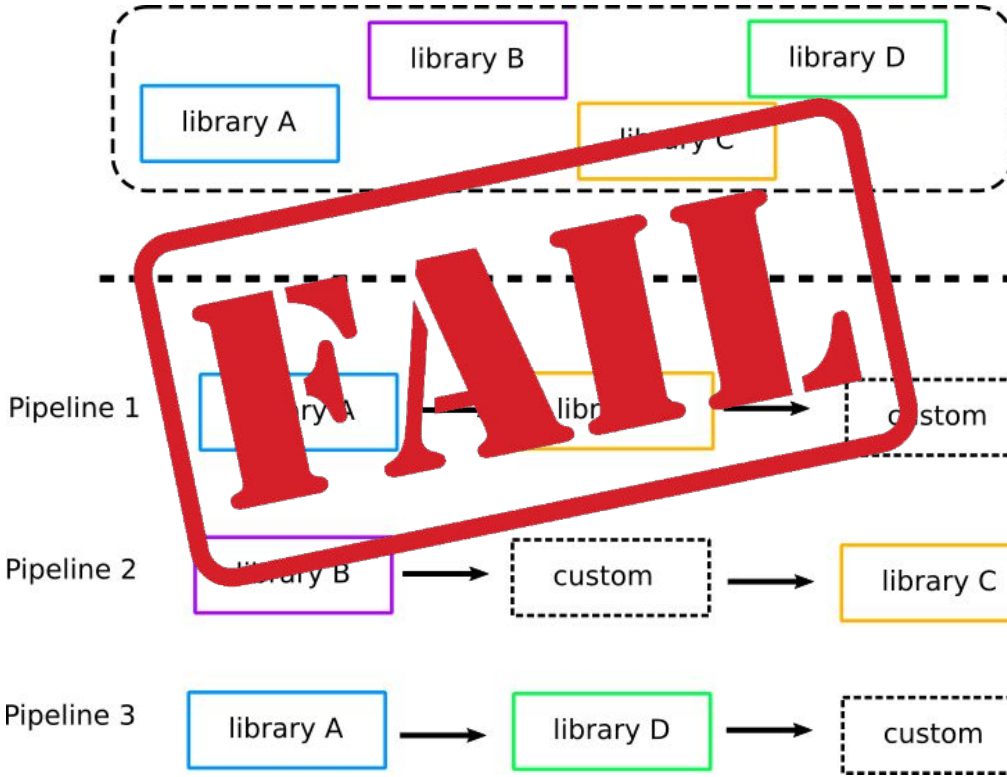
Requires everyone to use same version of library

Libraries often rely on each other in complex ways

Changes have to go to admins

Leads to big stability problems

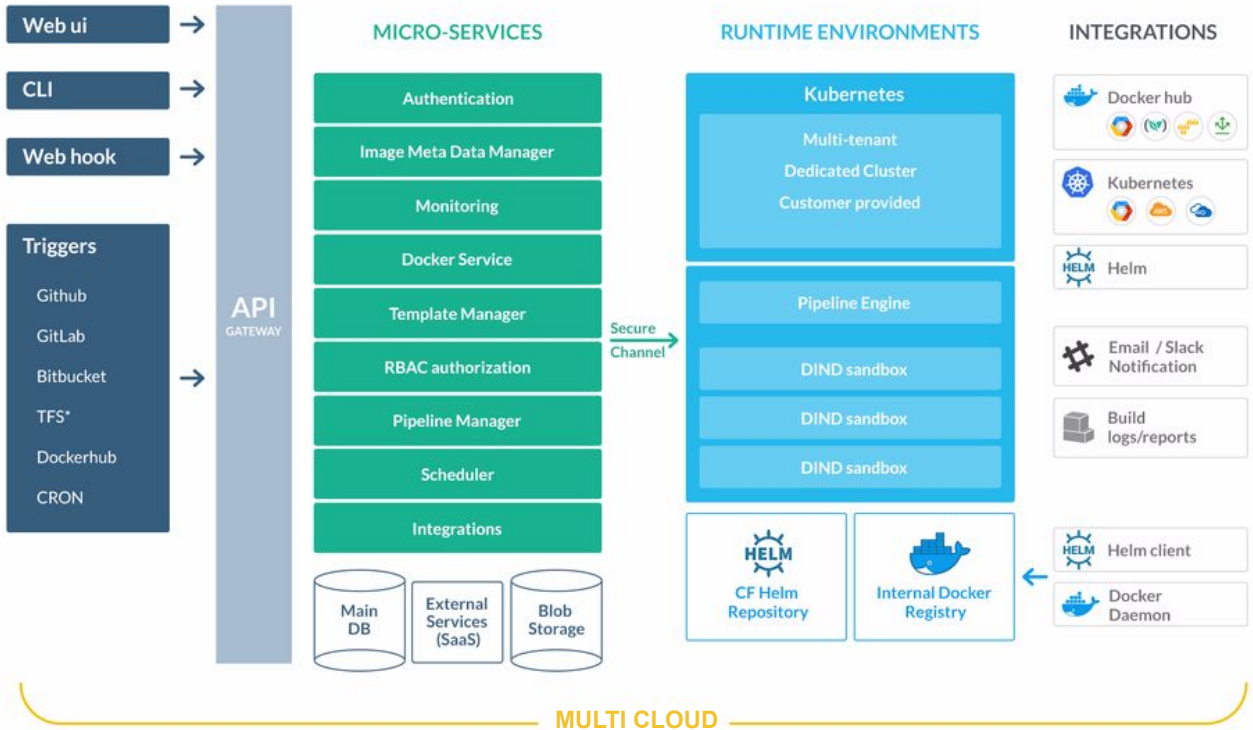
Relies on proprietary API



How Codefresh does CI/CD for Microservices

1. Container-based pipelines
2. Shared pipelines
3. Deployment testing

CODEFRESH ARCHITECTURE DIAGRAM



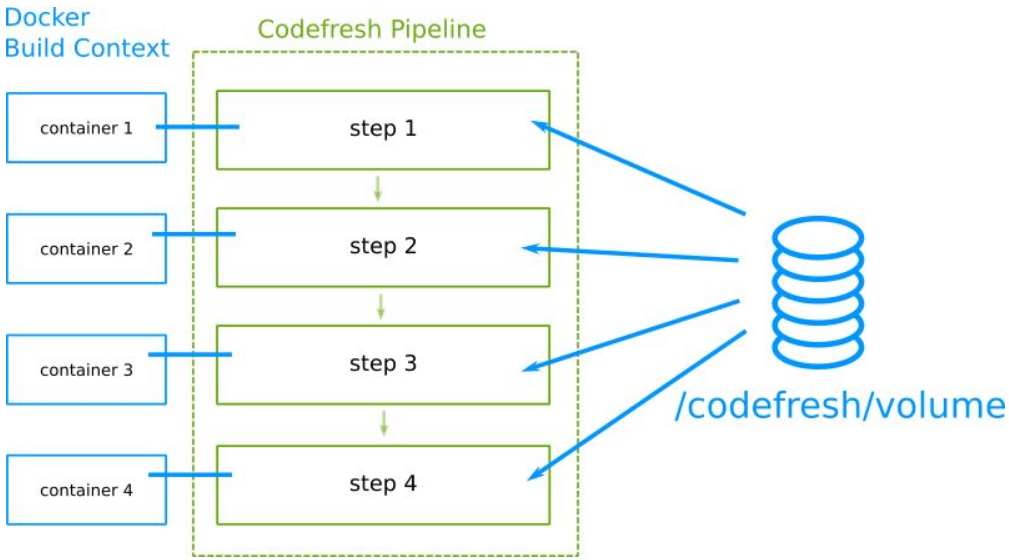
Container-based pipelines

Each task is built into a Docker image.

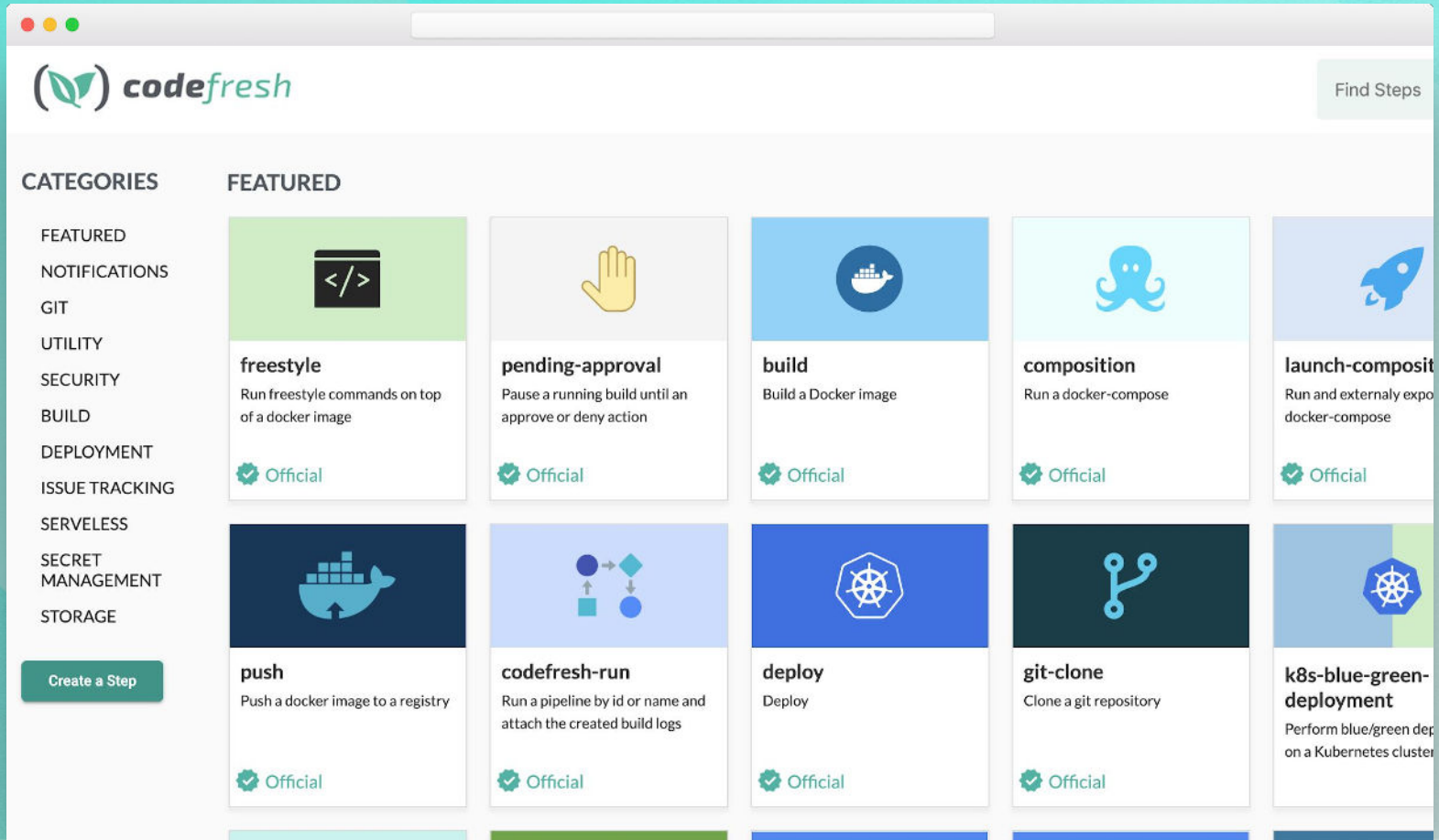
Users can self-serve these images.

Images DO NOT rely on each other.

Containers can be anything: go/node/c++



Huge open source library at steps.codefresh.io

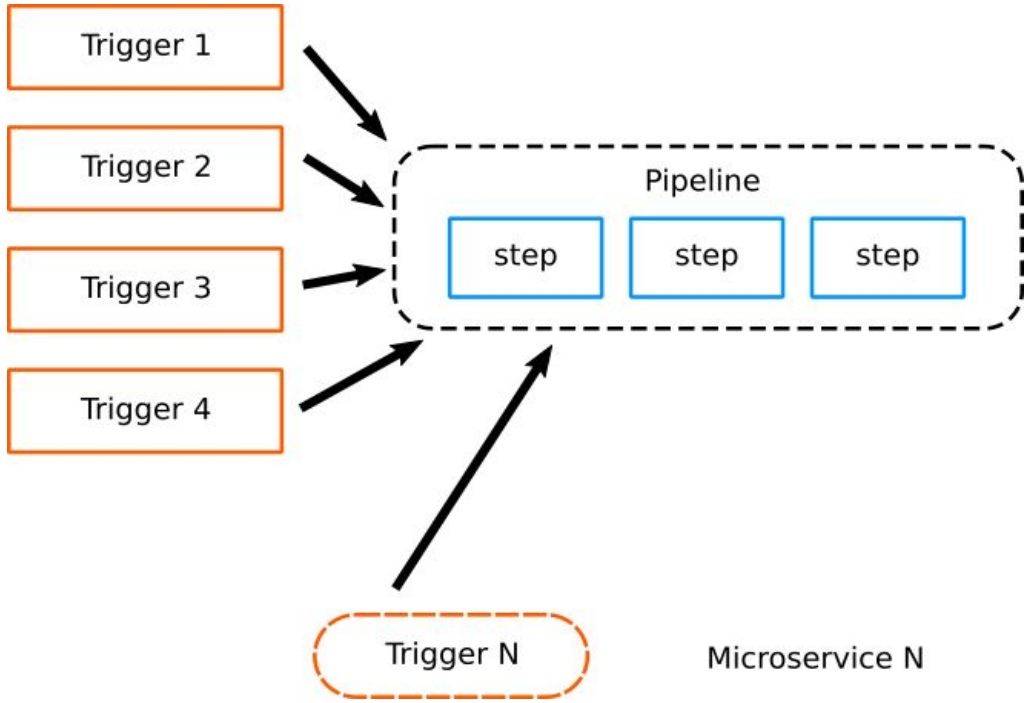


Use a single pipeline that operates *with context*

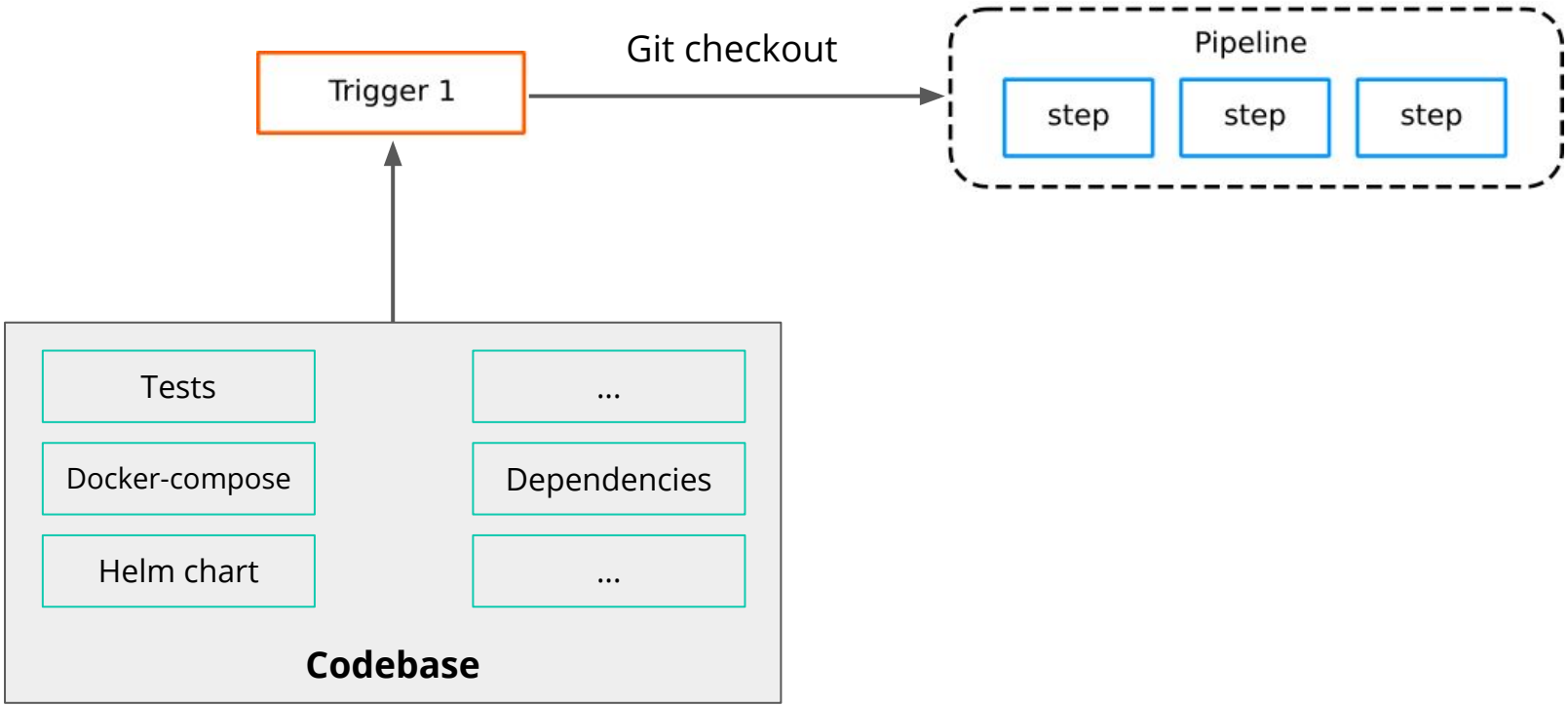
Maintain a single pipeline

Make microservices uniform

Change behavior based on context

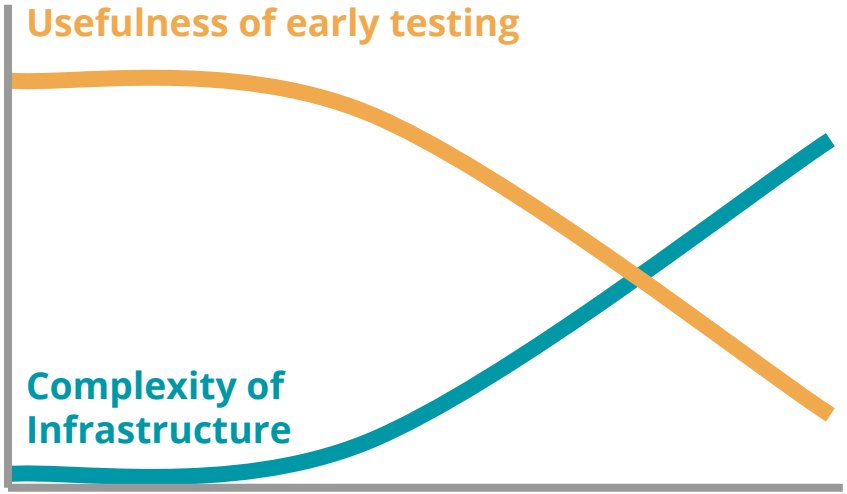


Triggers carry their context



Demo time!

Testing early becomes less useful as infrastructure complexity rises



https://codefresh.io/events/canary-deployment-helm-istio-codefresh/

Summary

Shared pipelines > libraries

Reusable Docker images > Copypasta

Deployment validation with canary

Read the blog post at
https://codefresh.io/continuous-deployment/ci-cd-pipelines-microservices/

Questions?

Want to try it yourself?
Open a FREE account today at Codefresh.io

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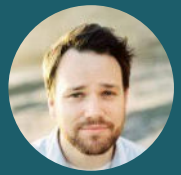
@todaywasawsome



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