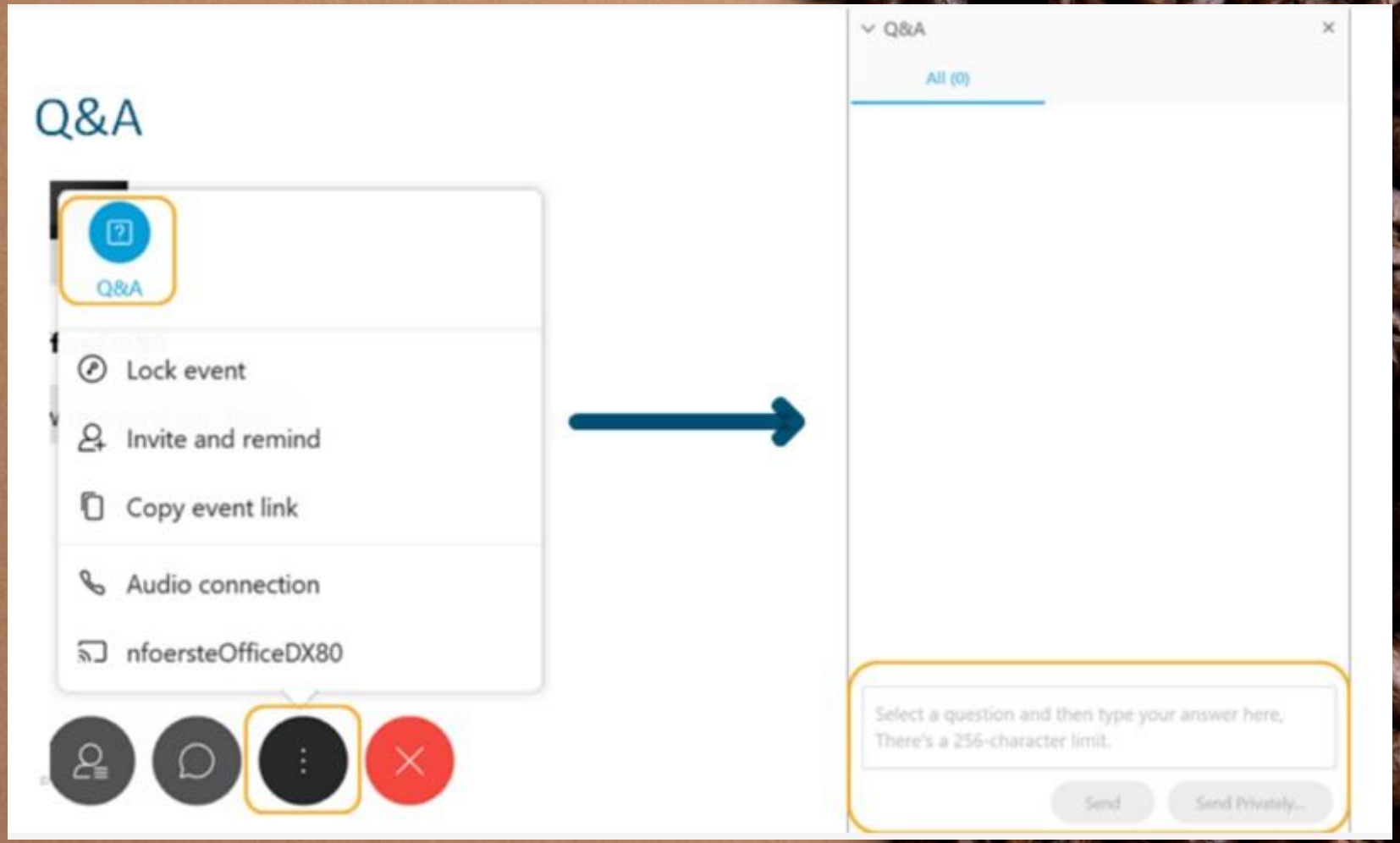
Wie funktioniert eigentlich NetDevOps?

Virtual Espresso Webinar

Mittwoch, 12. Januar 2022, 15:00 Uhr

👉 please utilise the Q&A function to get your question answered



The bridge to possible

Wie funktioniert eigentlich NetDevOps?

Marcel Neidinger
Software Solutions Engineer, EMEAR Systems Engineering
12th of January, 2022

A DevOps Recap

*“**Progress** is impossible without **change** […]”*

George Bernard Shaw
American Playwright

“Move fast and break things.”

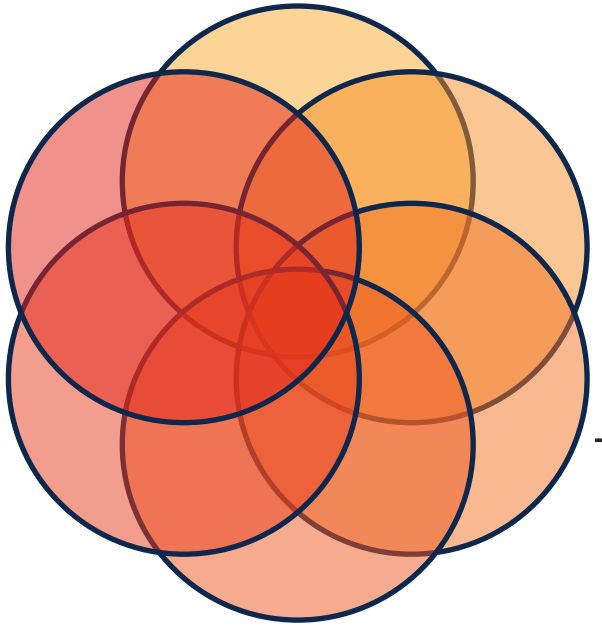
Mark Zuckerberg
Founder and CEO
Facebook Inc.


If you like your jo
Don't break
things.

Culture of Fear

Changes happen rarely

Change seen as failure



All changes are big and complex

Problem occurs during change

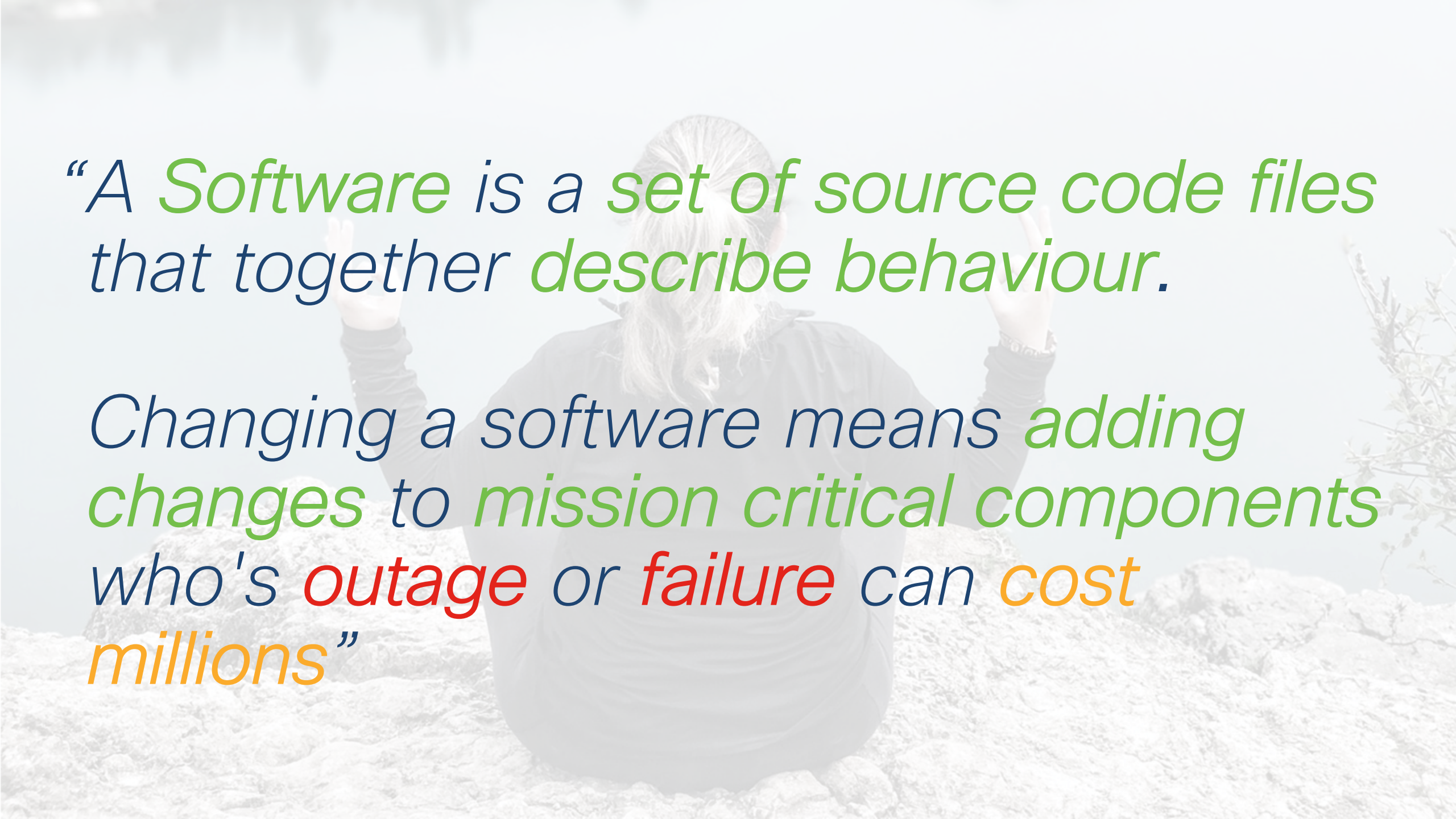
The team isn't practiced

Change is (seen as) high risk


Are we the
first?

Software is the

same

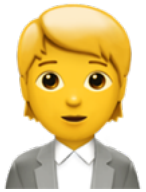


"A Software is a set of source code files that together describe behaviour.

Changing a software means adding changes to mission critical components who's outage or failure can cost millions"

What problem does DevOps solve?

The teams



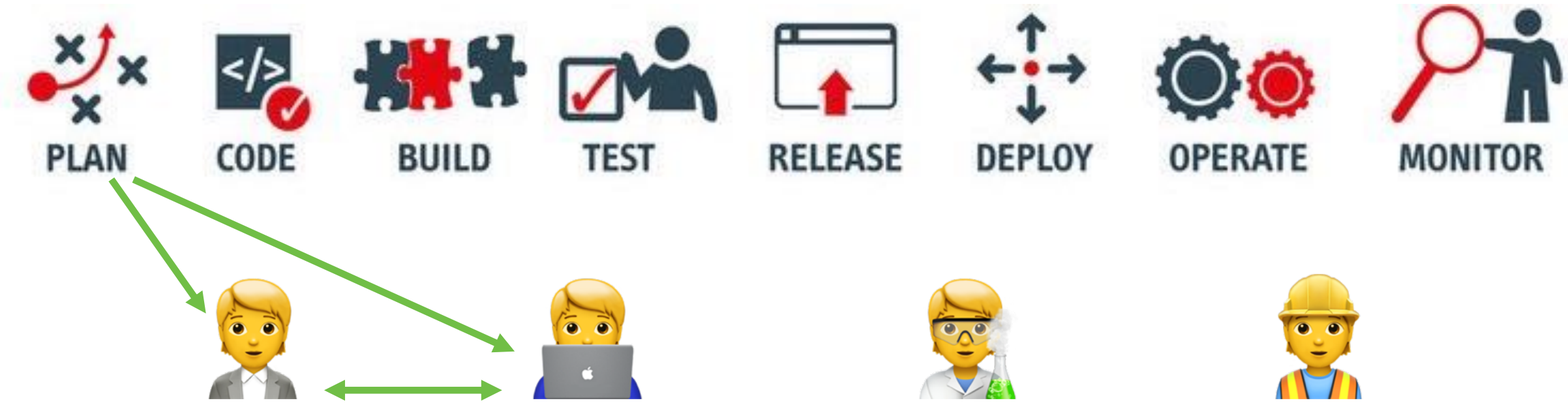
Business

Development

Testing

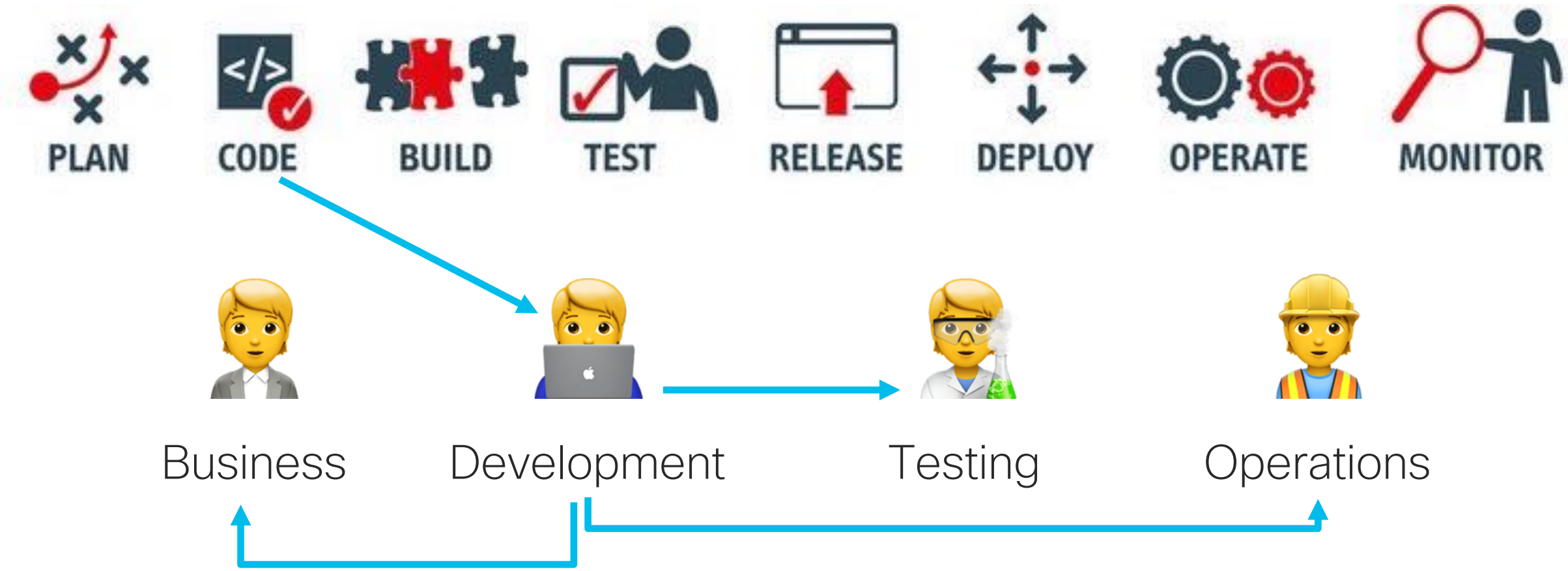
Operations

Plan



Business Development Testing Operations

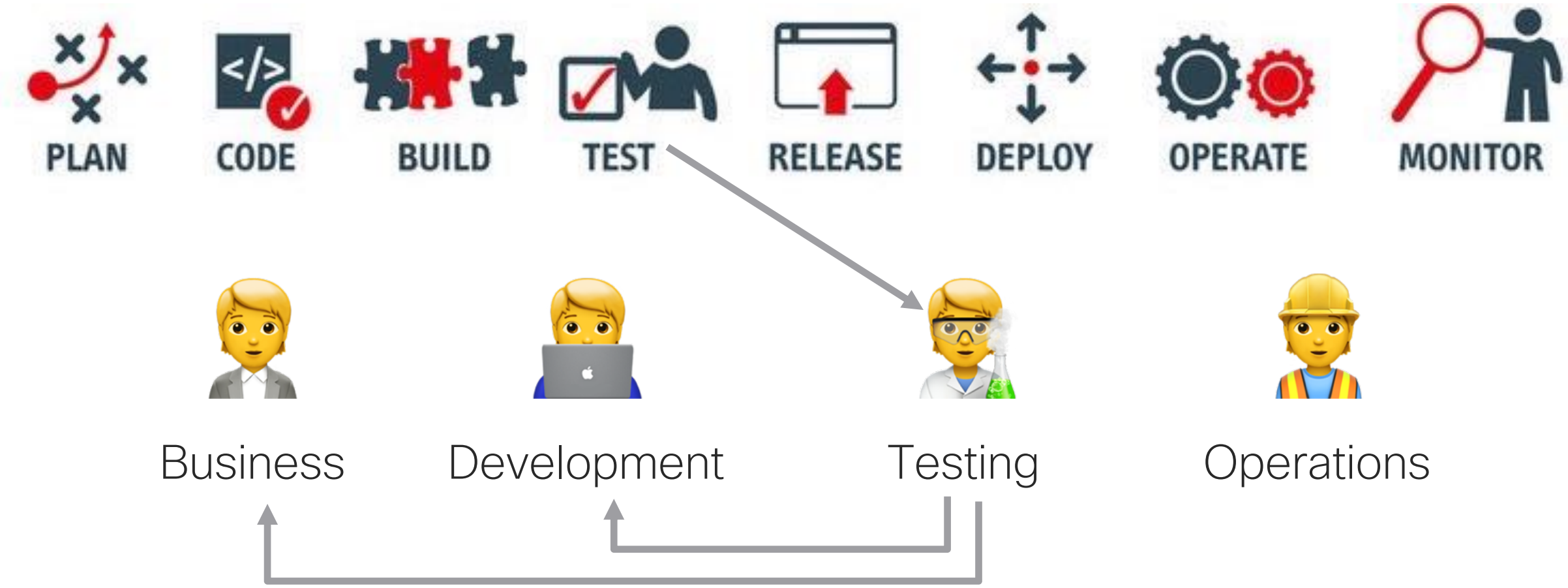
Development



Build

Business Development Testing Operations

Test



Release

Business Development Testing Operations

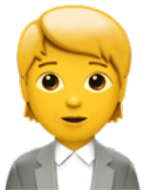
Deploy

Business Development Testing Operations

Operate

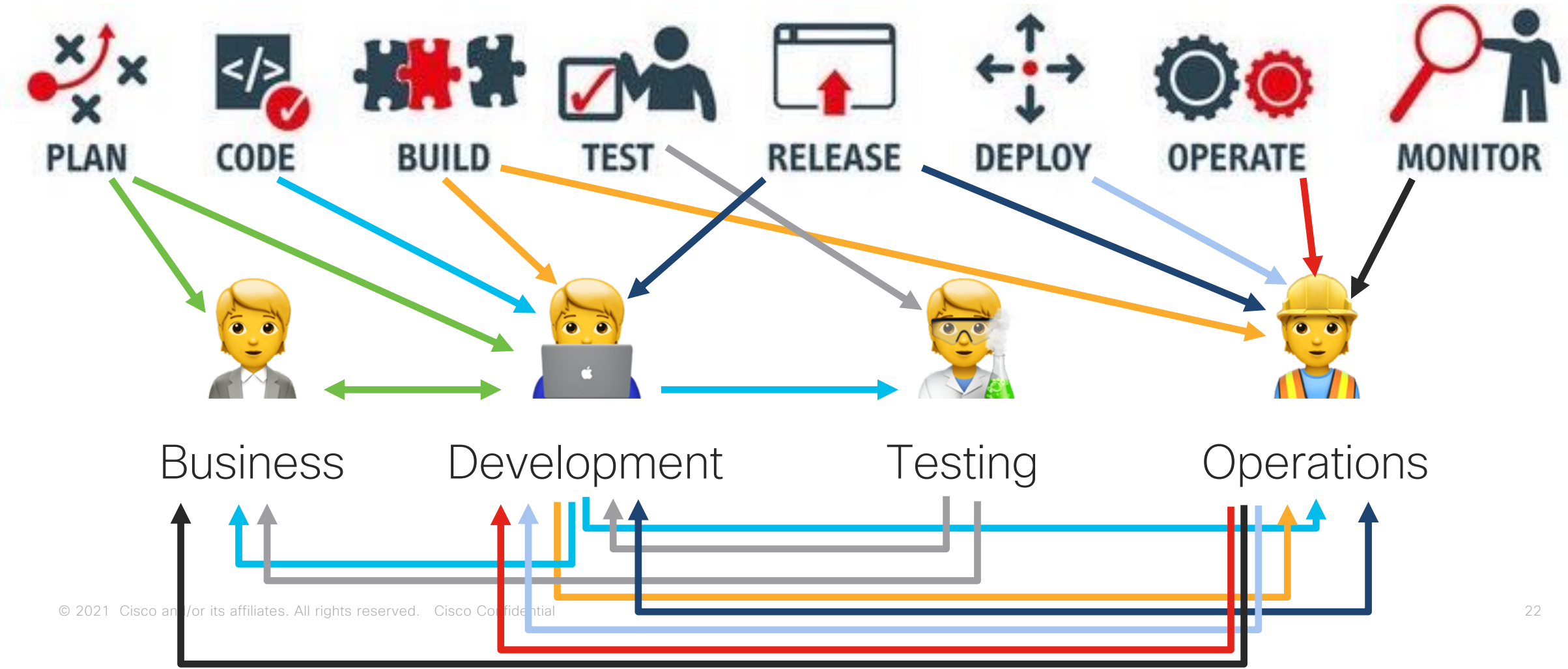
Business Development Testing Operations

Monitor




Business Development Testing Operations

Let’s put all these connections together

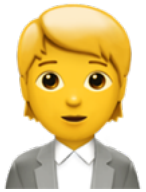


Different **team culture**

Different **workflows**

Different ‘**language**’

Different **deliverables**



Business

Development

Testing

Operations

Different **tools**

Different **priorities**

Different **metrics**

Different **targets**

50.000.000

deploys across all services *

*That includes all development, testing and production systems

Source:
The Story of Apollo - Amazon's Deployment Engine, Werner Vogels (amazon CTO), https://www.allthingsdistributed.com/2014/11/apollo-amazon-deploymer

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CI/CD

Continous Integration

Continous Delivery

A CI/CD Pipeline

Commit Changes
Changes to the source code are commited to the VCS.

Changes are Build
A new version of the software is build.

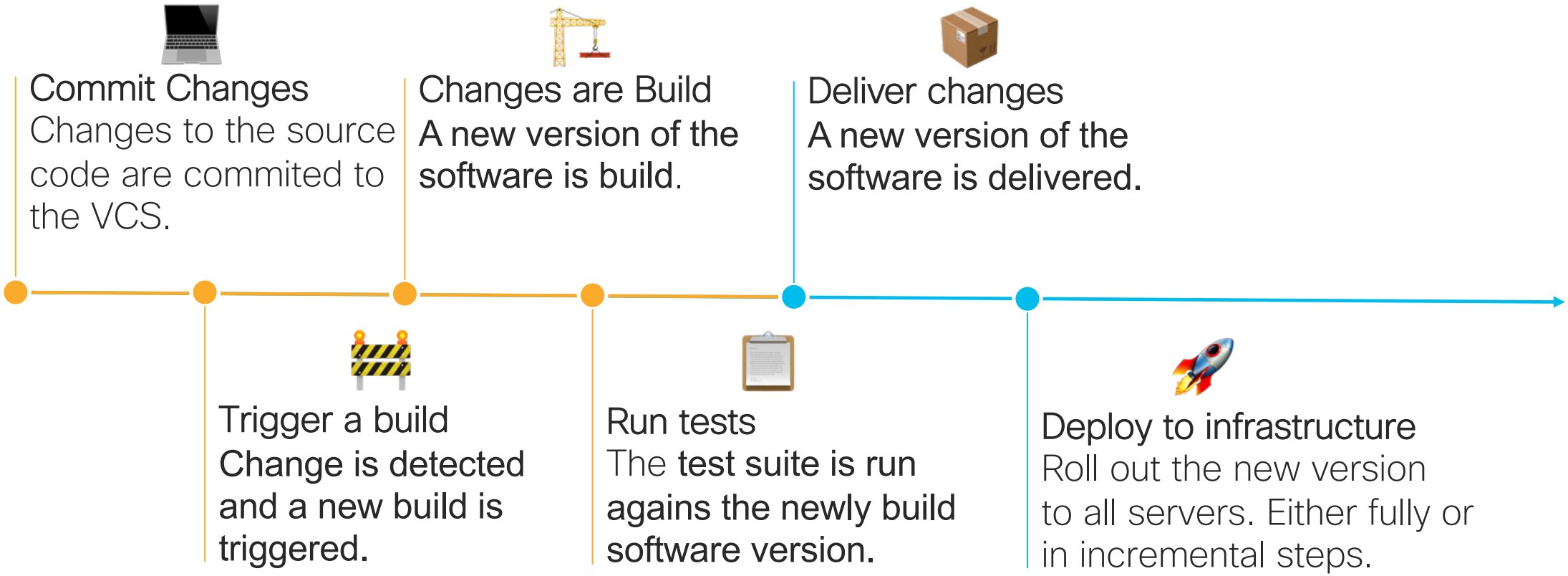
Deliver changes
A new version of the software is delivered.

Trigger a build
Change is detected and a new build is triggered.

Run tests
The test suite is run agains the newly build software version.

Deploy to infrastructure
Roll out the new version to all servers. Either fully or in incremental steps.

A CI/CD Pipeline



A CI/CD Pipeline

- Continous Integration
- Continous Delivery

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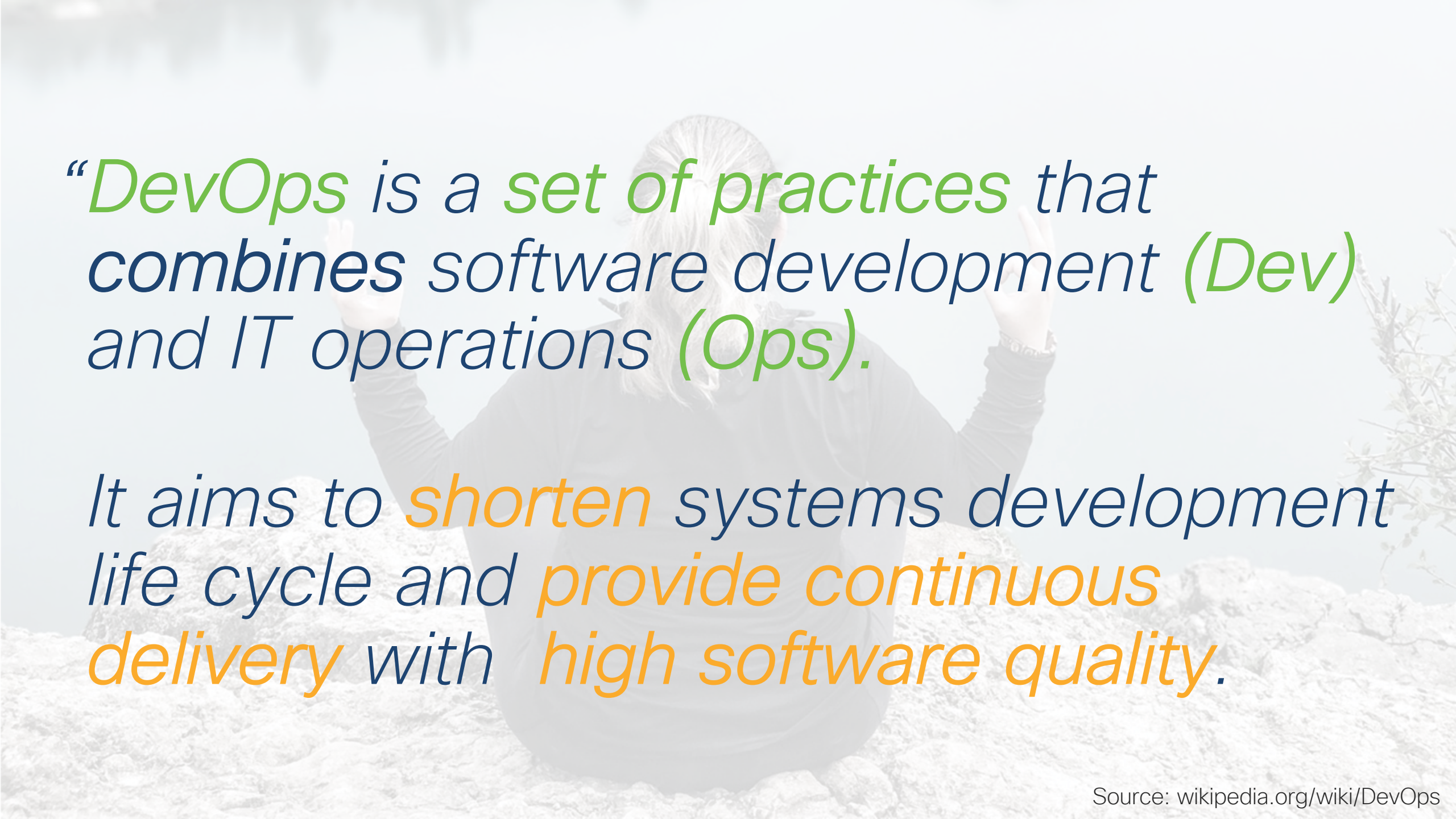
Mindset Change

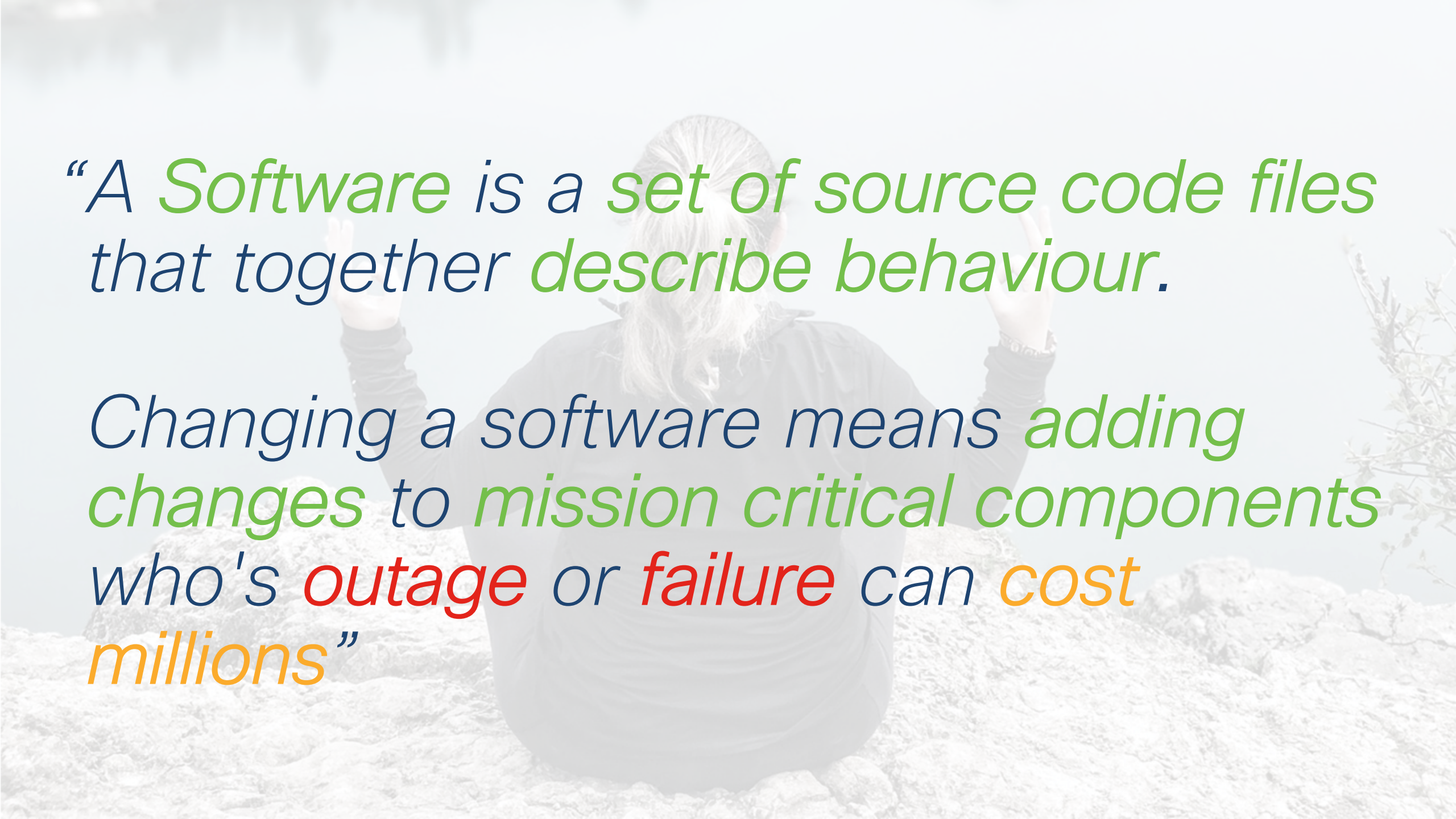


"*DevOps is a set of practices that* ***combines*** *software development (Dev) and IT operations (Ops).*

It aims to shorten systems development life cycle and provide continuous delivery with high software quality.

Source: wikipedia.org/wiki/DevOps

From DevOps to NetDevOps



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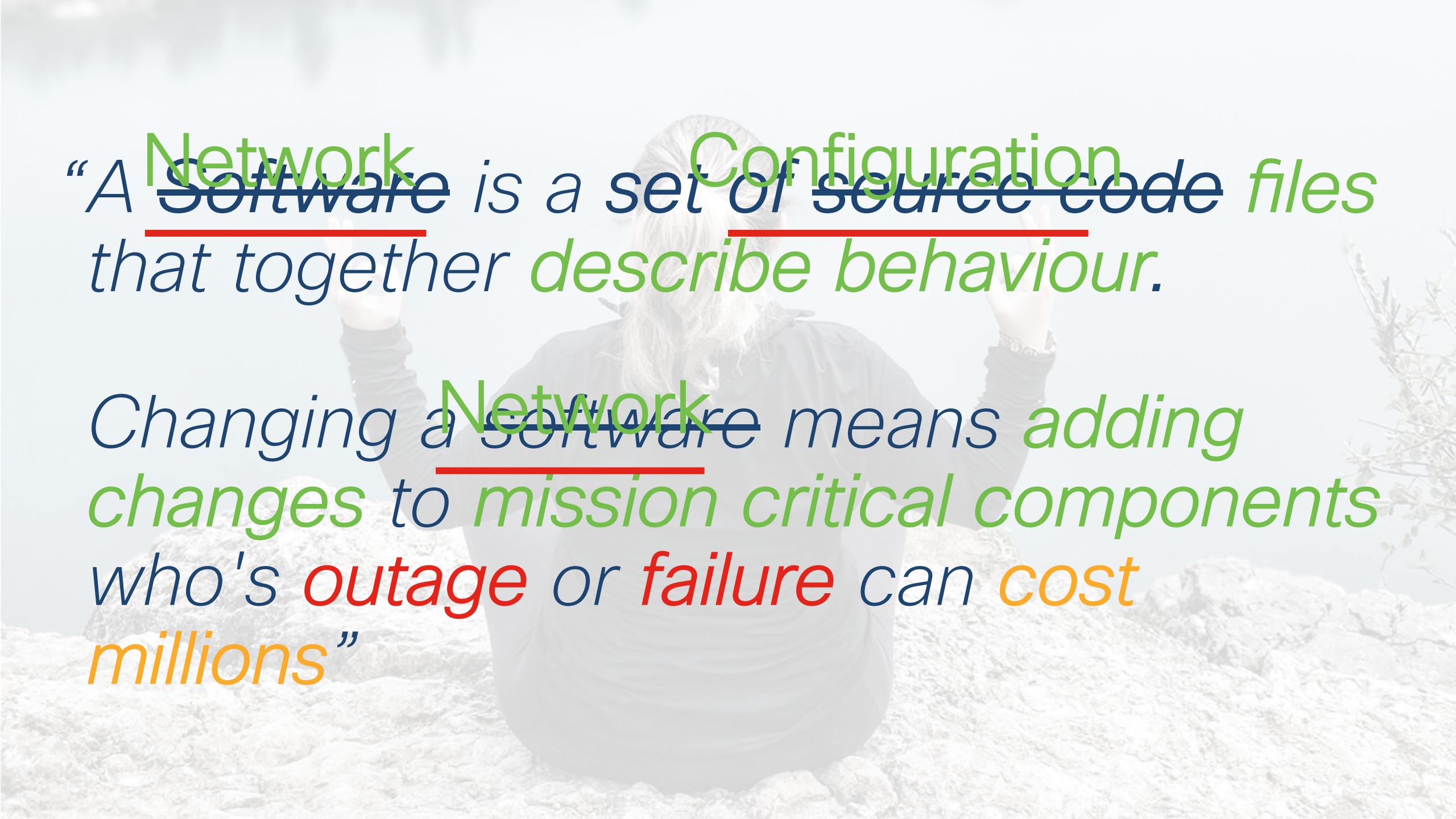


"A ~~Software~~ is a set of ~~source code~~ files that together describe behaviour.

Changing a ~~software~~ means adding changes to mission critical components who's outage or failure can cost millions"

"NetDevOps brings the **culture**, **technical** **methods**, **strategies**, *and* **best practices** *of DevOps to Networking"*

Hank Preston
Network Programmability Evangelist
Cisco DevNet

Harder to push updates

Harder to “spin up” version for testing

Infrastructure
is not equal to
Code

Harder to define changes

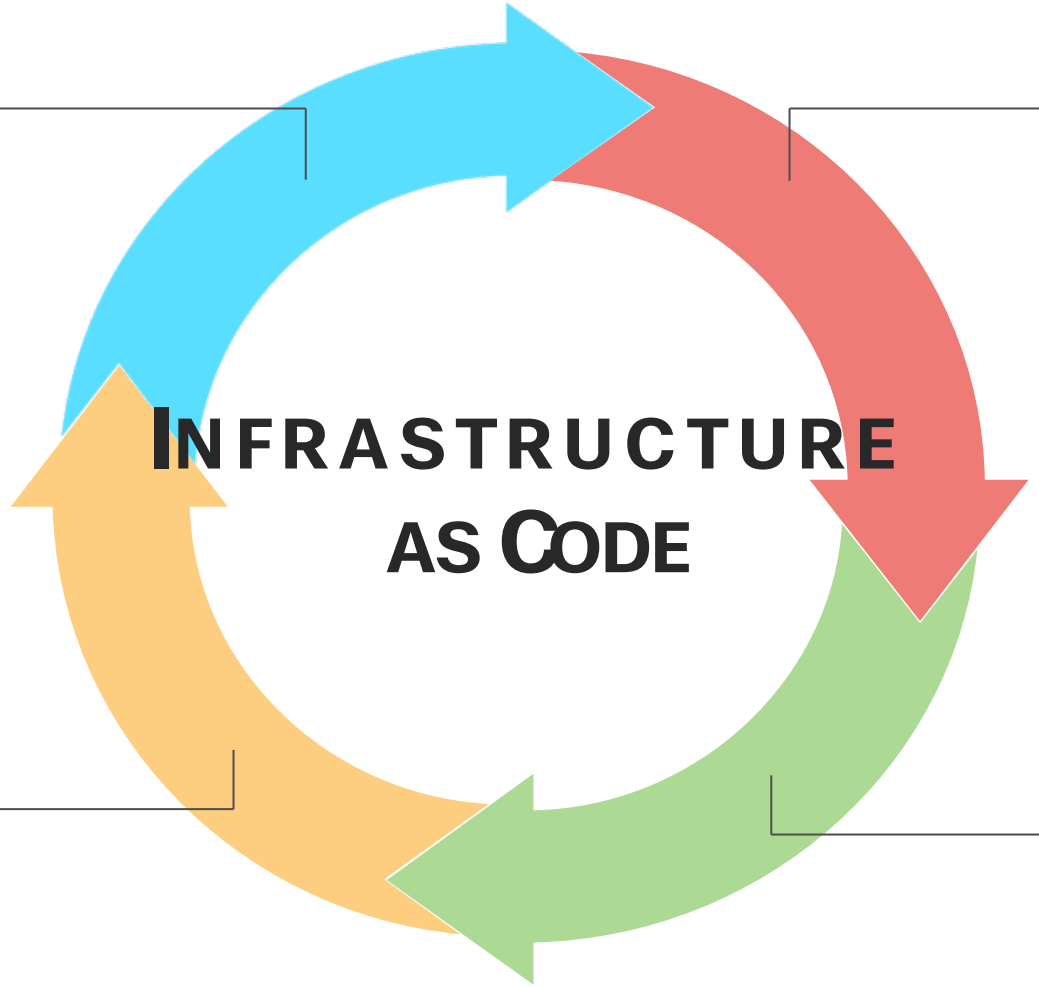
Harder to test without device access

Infrastructure *as* Code

What is NetDevOps then?

Deploy
Continuous Delivery

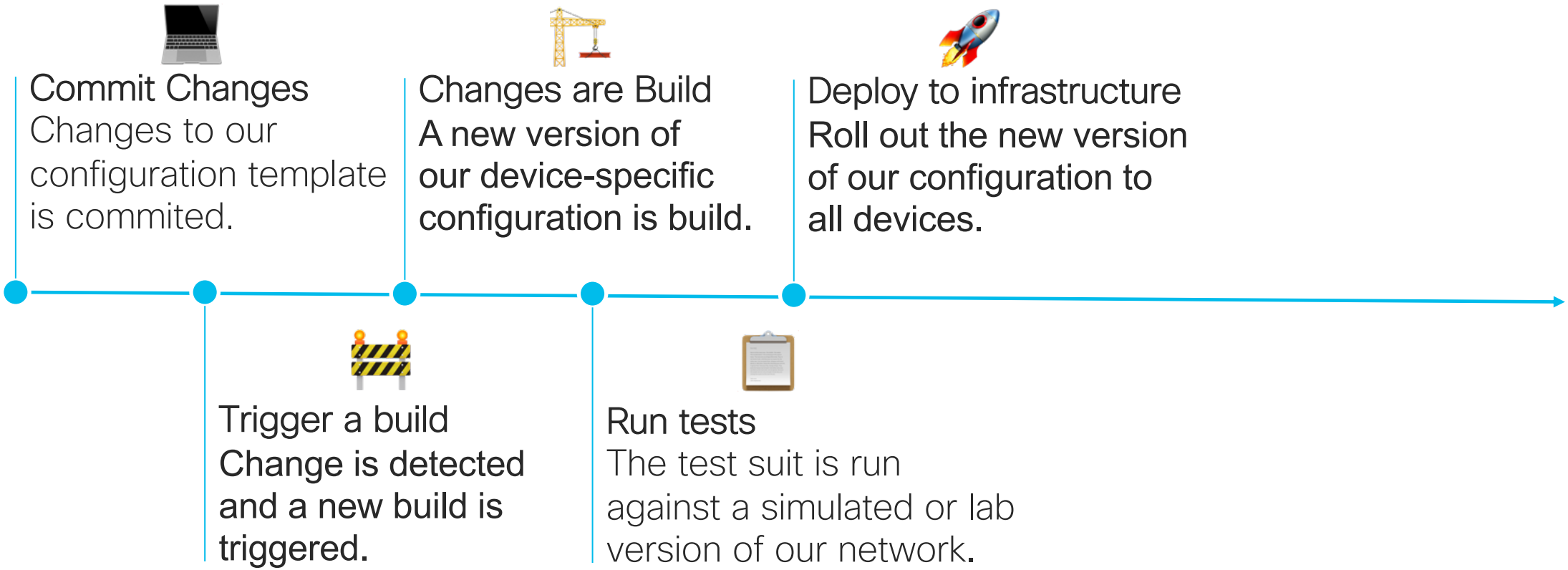
Test
Automated Validation



Design
Collaborative

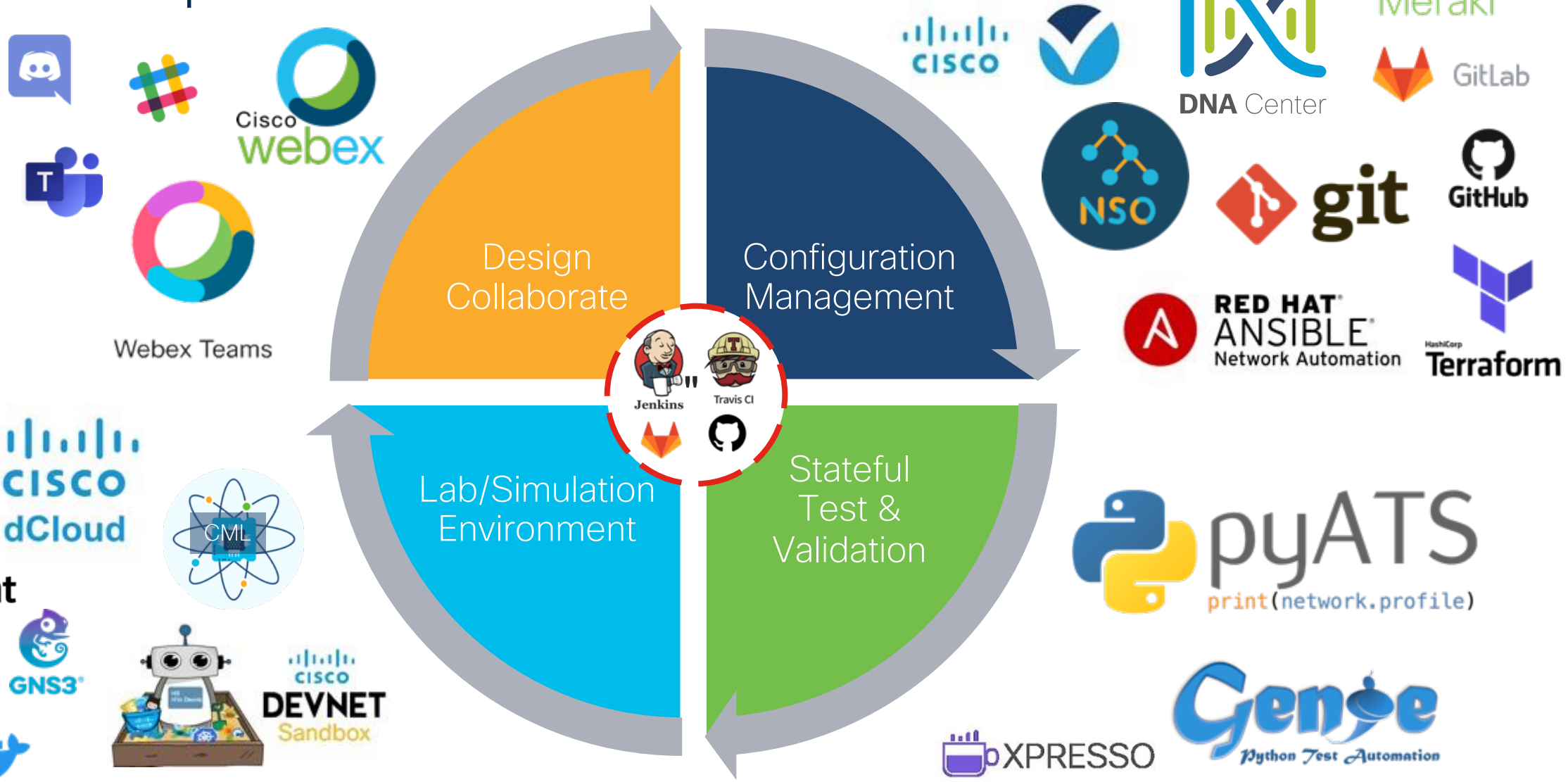
Rollout
Continuous Operations

Adopting the CI/CD Pipeline for NetDevOps

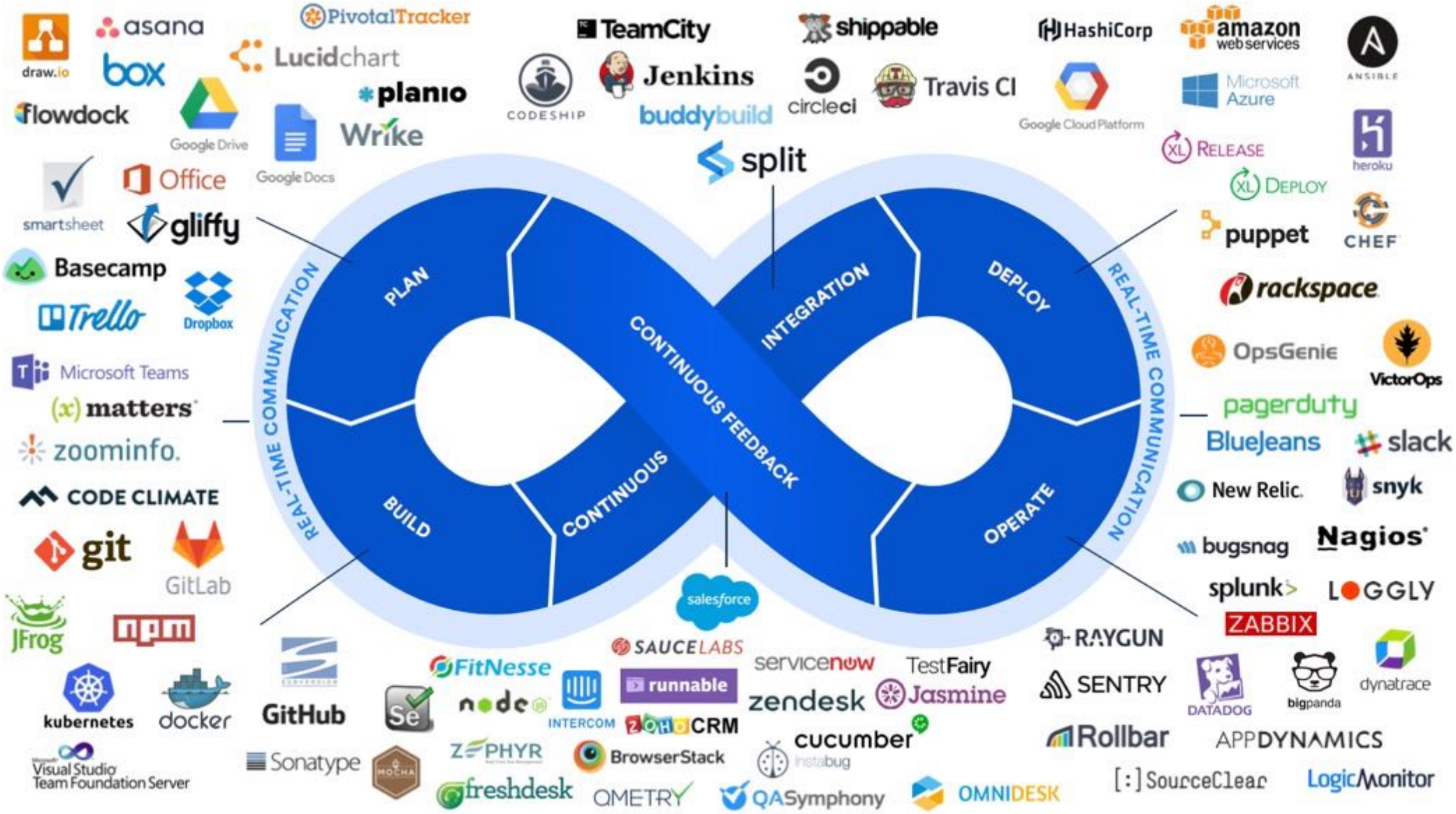


An Overview of our Tools

NetDevOps Tools



DevOps Tools



Commit Changes

Build Changes

Trigger a build

Changes are build

Run Tests

pyATS

print(network.profile)

CML

GNS3®

CISCO DEVNET Sandbox

Deploy to Infrastructure

Designing our NetDevOps pipeline

~~Implement a change to our configuration template~~

- Write a change to our jinja2 template
- Test generated config locally

Implement a change to our configuration template

Push this change to our VCS and trigger build

- Push our changed config template to git
- Use gitlab CI/CD runner to trigger build after commit
- Pipeline is specified in `.gitlab-ci.yml`

Implement a change to our configuration template

Push this change to our VCS

Pull information from NetBox and build config

- Pipeline compiles templates
- Device-specifc context is retrieved from NetBox
- Config is rendered using context from NetBox

Implement a change to our configuration template

Push this change to our VCS

Pull information from NetBox and build config

Run Config changes against CML

- Configure new testing lab in CML (using API)
- Configuration changes are applied to virtualized lab

Implement a change to our configuration template

Push this change to our VCS

Pull information from NetBox and build config

Run Config changes against CML

Run pyATS tests against CML

- Retrieve testbed from CML API
- pyATS tests are run against the CML-based simulated environment using testbed

Implement a change to our configuration template

Push this change to our VCS

Pull information from NetBox and build config

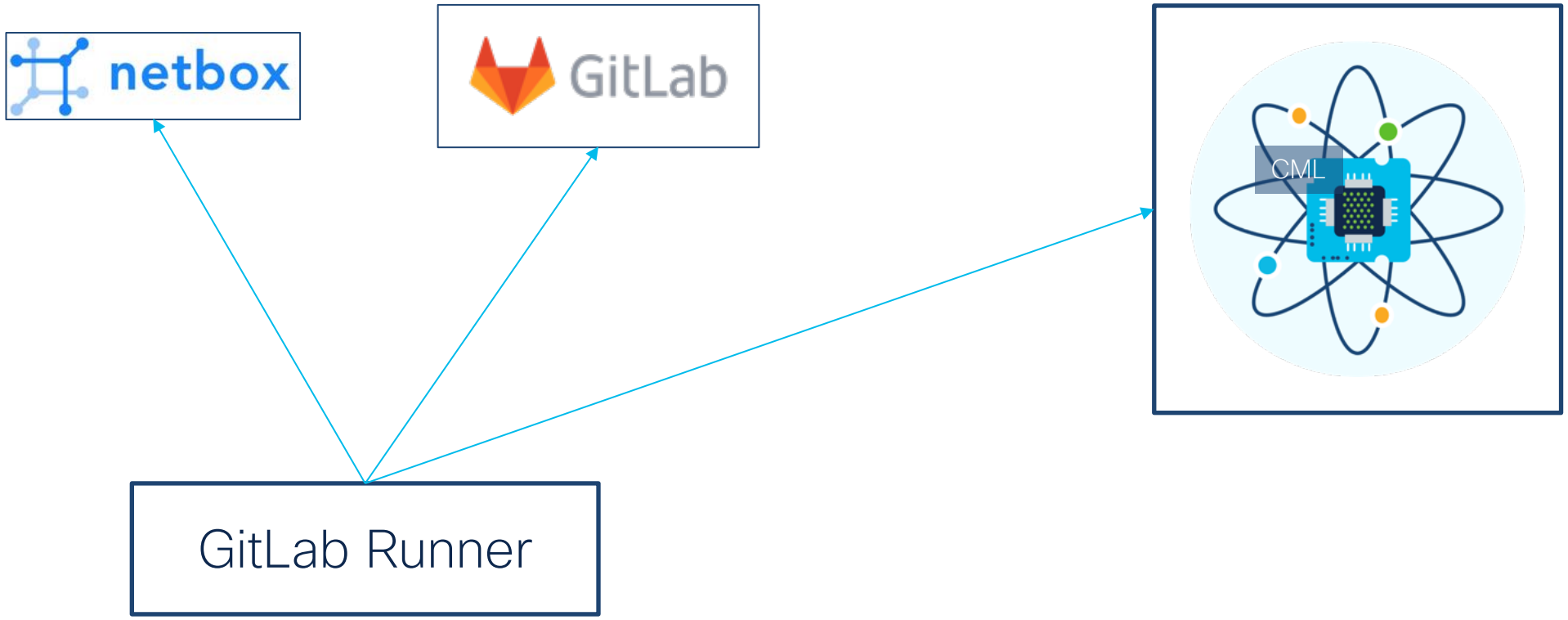
Run Config changes against CML

Run pyATS tests against CML

Deploy changes to production

- Generate production testbed from NetBox
- Run pyATS changes against production testbed

How does this look like in practice?



Lab Guide

https://github.com/sQu4rks/netdevops-pipeline-lab/

Fragen?

OUTLOOK Upcoming Virtual Espresso

- Blog: https://gblogs.cisco.com/ch-de/tag/virtual-espresso/
- Topics:
  - 26.01.2022: Automation X für X-Domain Automation und Analytics
  - 09.02.2022: ThousandEyes
  - 23.02.2022: Netzwerk Trends in der hybriden Arbeitswelt
  - 09.03.2022: Switching Innovations
  - 23.03.2022: WiFi Innovations

dankä villmal
grazie mille
merci beaucoup
grazia fitg
thank you