

FOSSASIA 2021

Paving the Road to Continuous Delivery with Trunk-Based Development & Feature Toggles



Michael
Lihs



Paul
Börding



Paul Börding

Developer



Hamburg (Germany)



Board games



@PaulB5g



Michael Lihs

Infrastructure Consultant



Tübingen (Germany)



Cycling

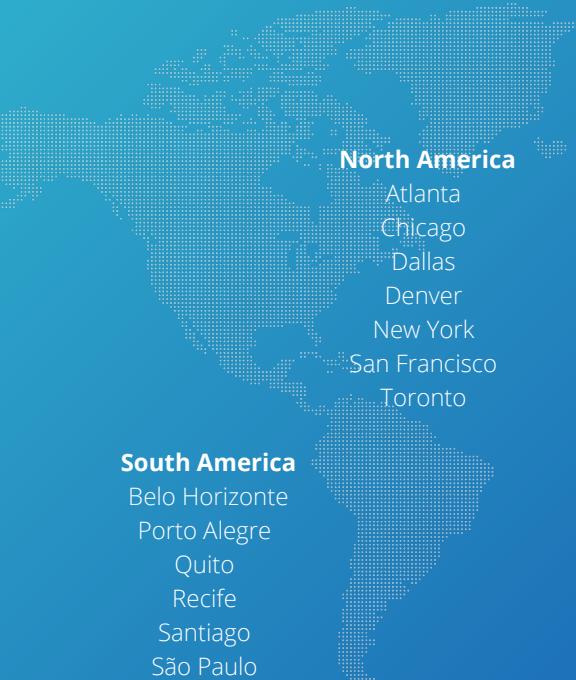


Guitar



@kaktusmimi

THOUGHTWORKS: An international Software Consultancy



Europe

Amsterdam
Barcelona
Berlin
Bologna
Bukarest
Cluj-Napoca
Hamburg
Helsinki
Iasi
Köln
London
Madrid
Manchester
Mailand
München
Stuttgart

South America

Belo Horizonte
Porto Alegre
Quito
Recife
Santiago
São Paulo

India

Bangalore (2)
Chennai
Coimbatore
Gurgaon
Hyderabad
Mumbai
Pune

Australia

Brisbane
Melbourne
Sydney

Thailand

Singapore

China
Peking
Chengdu
Hong Kong
Shanghai
Shenzhen
Wuhan
Xi'an

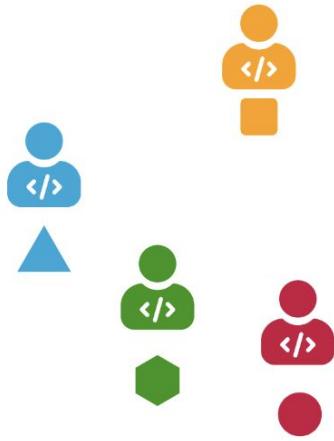
8.000+
Employees

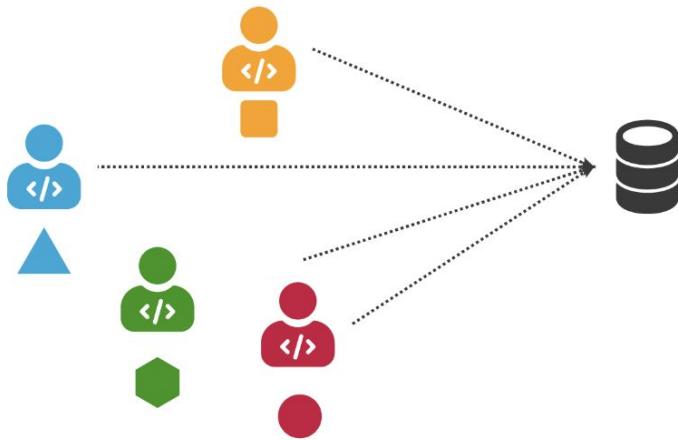
17
Countries

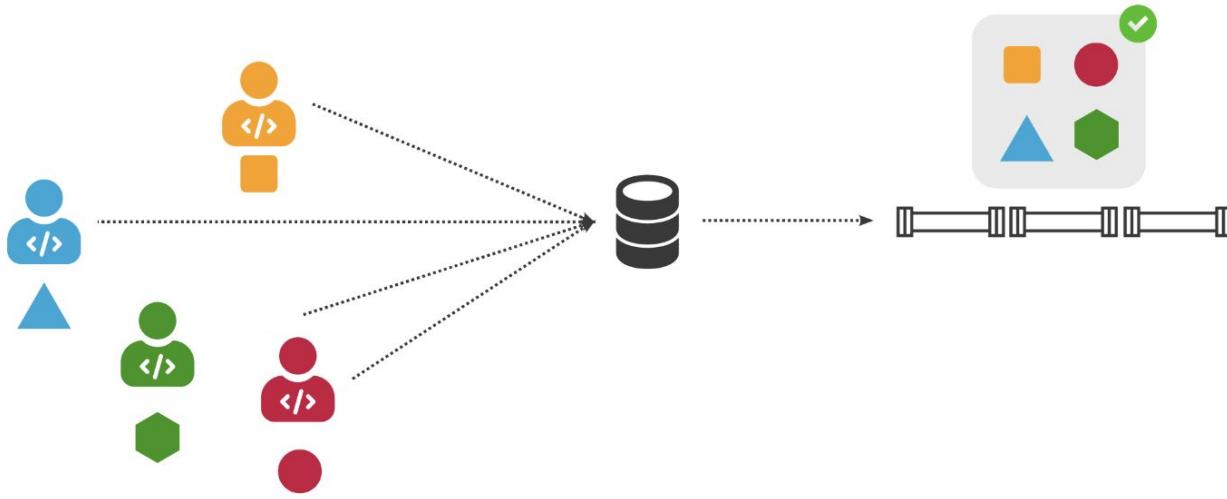
48
Offices

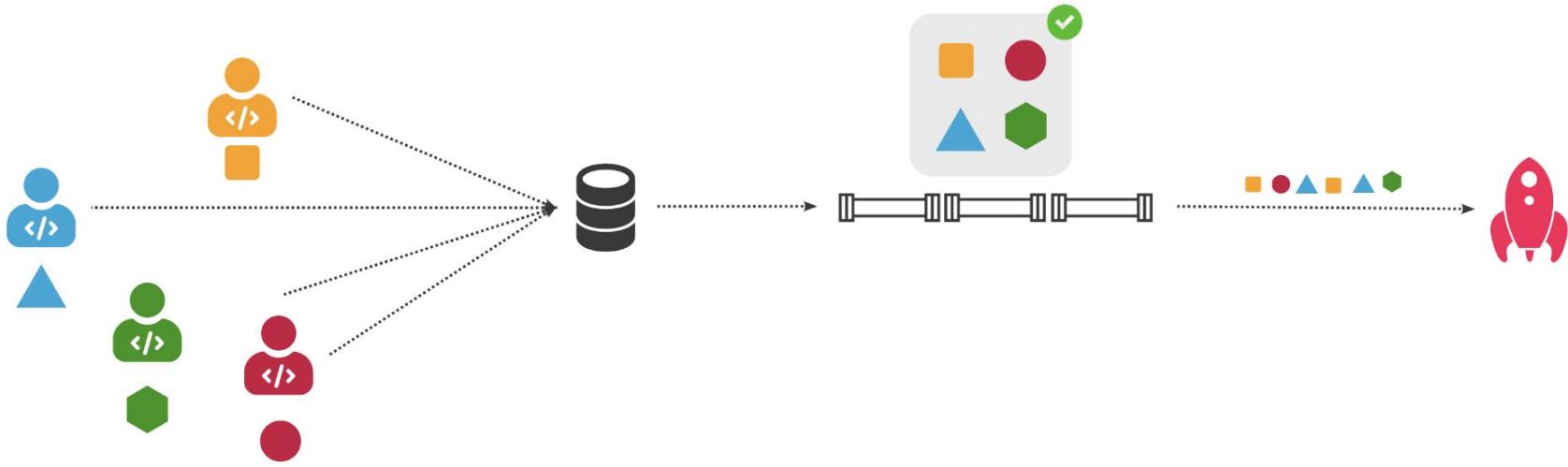
26+
Years

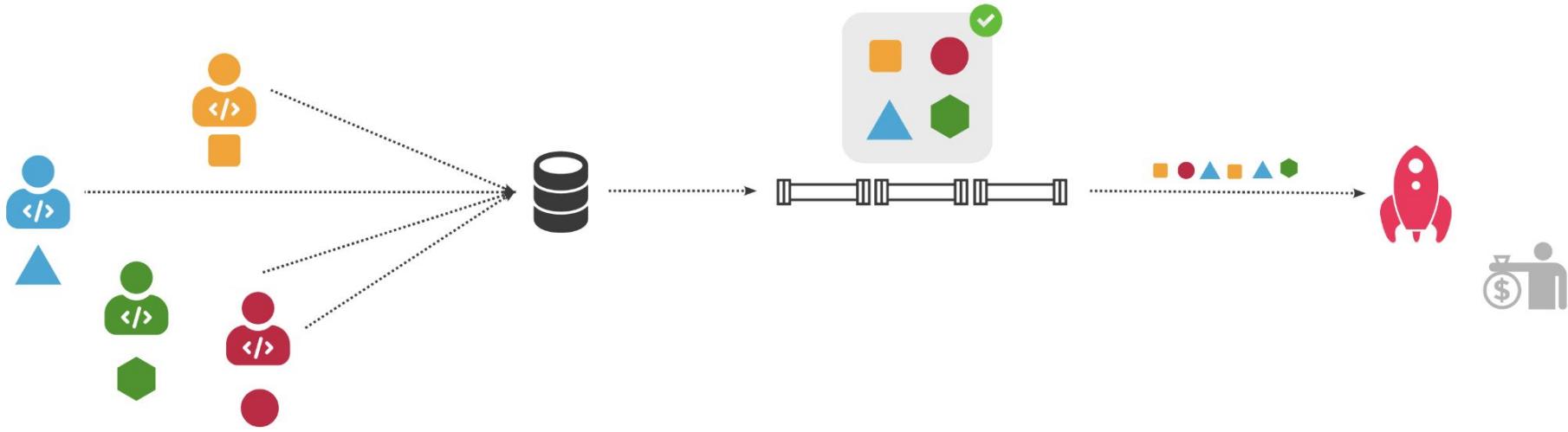


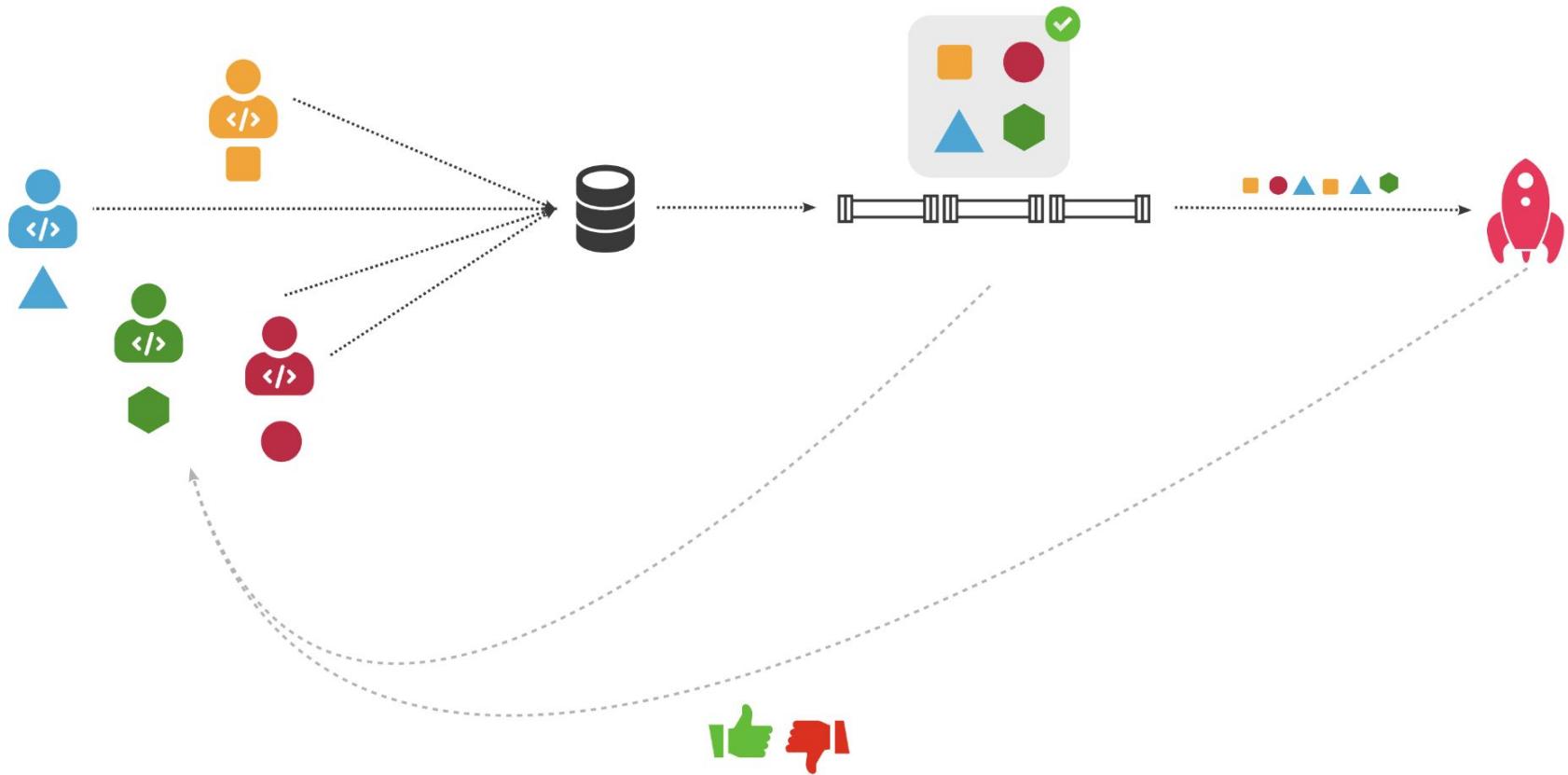




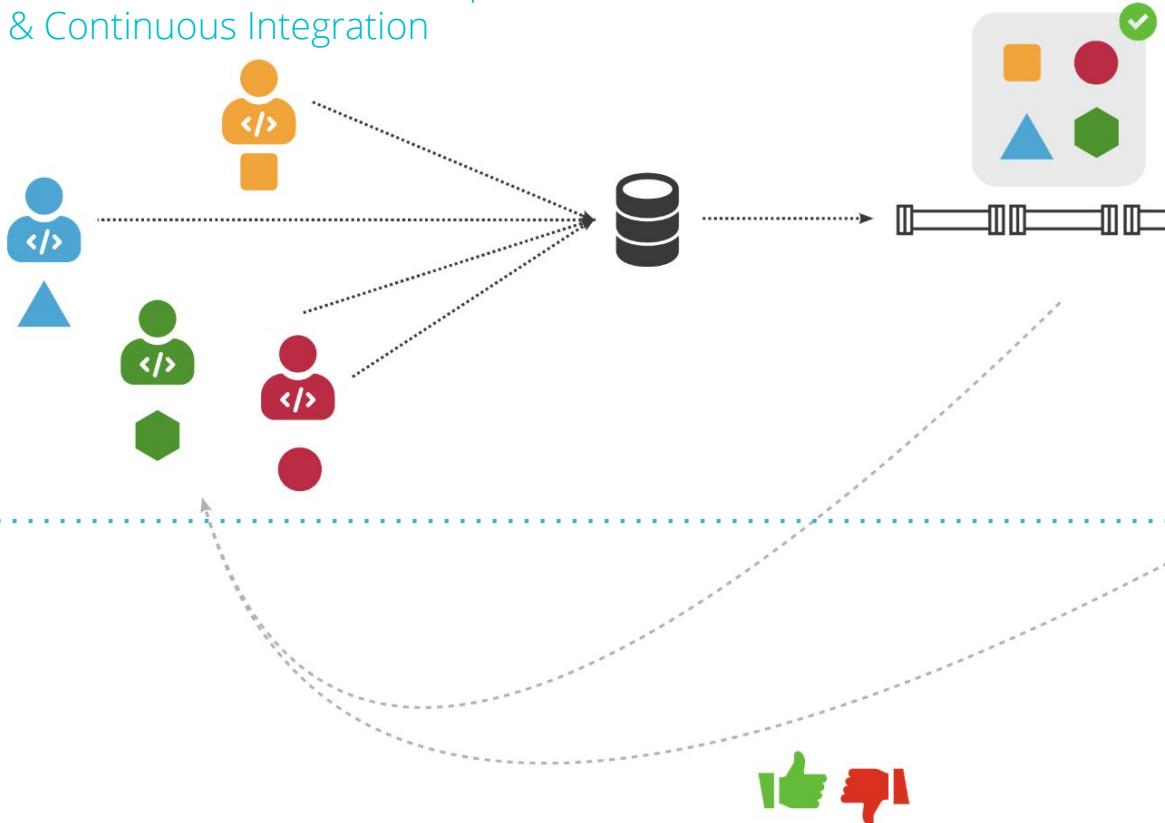




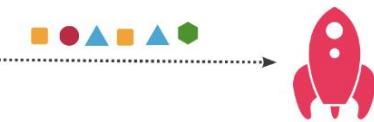


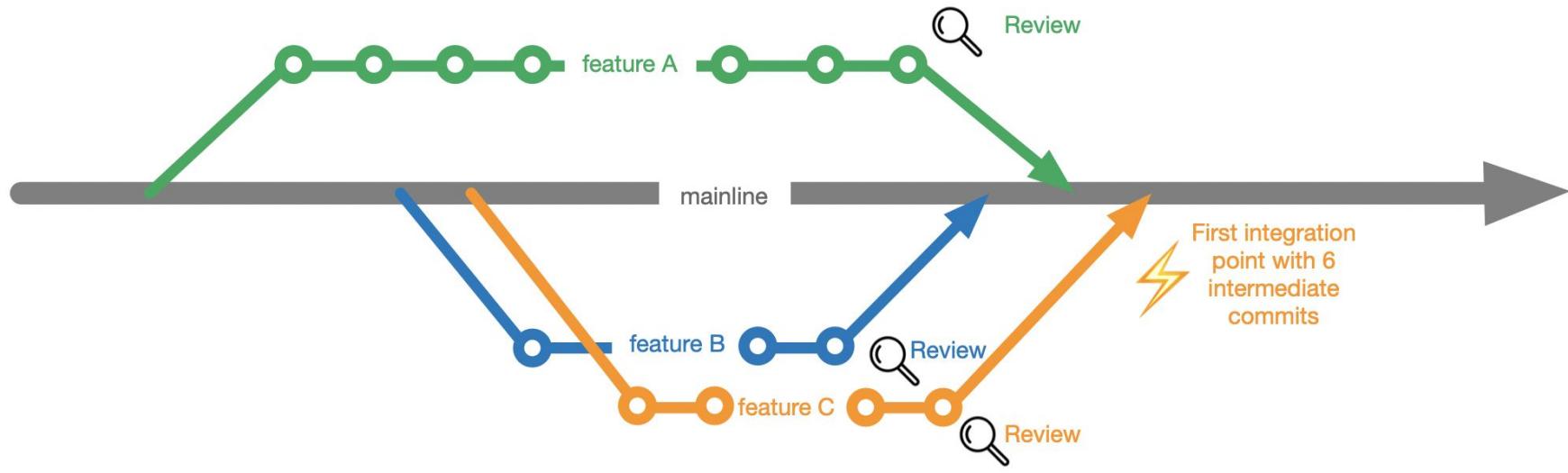


Part 1 - Trunk-based development & Continuous Integration



Part 2 - Feature Toggles & Continuous Delivery





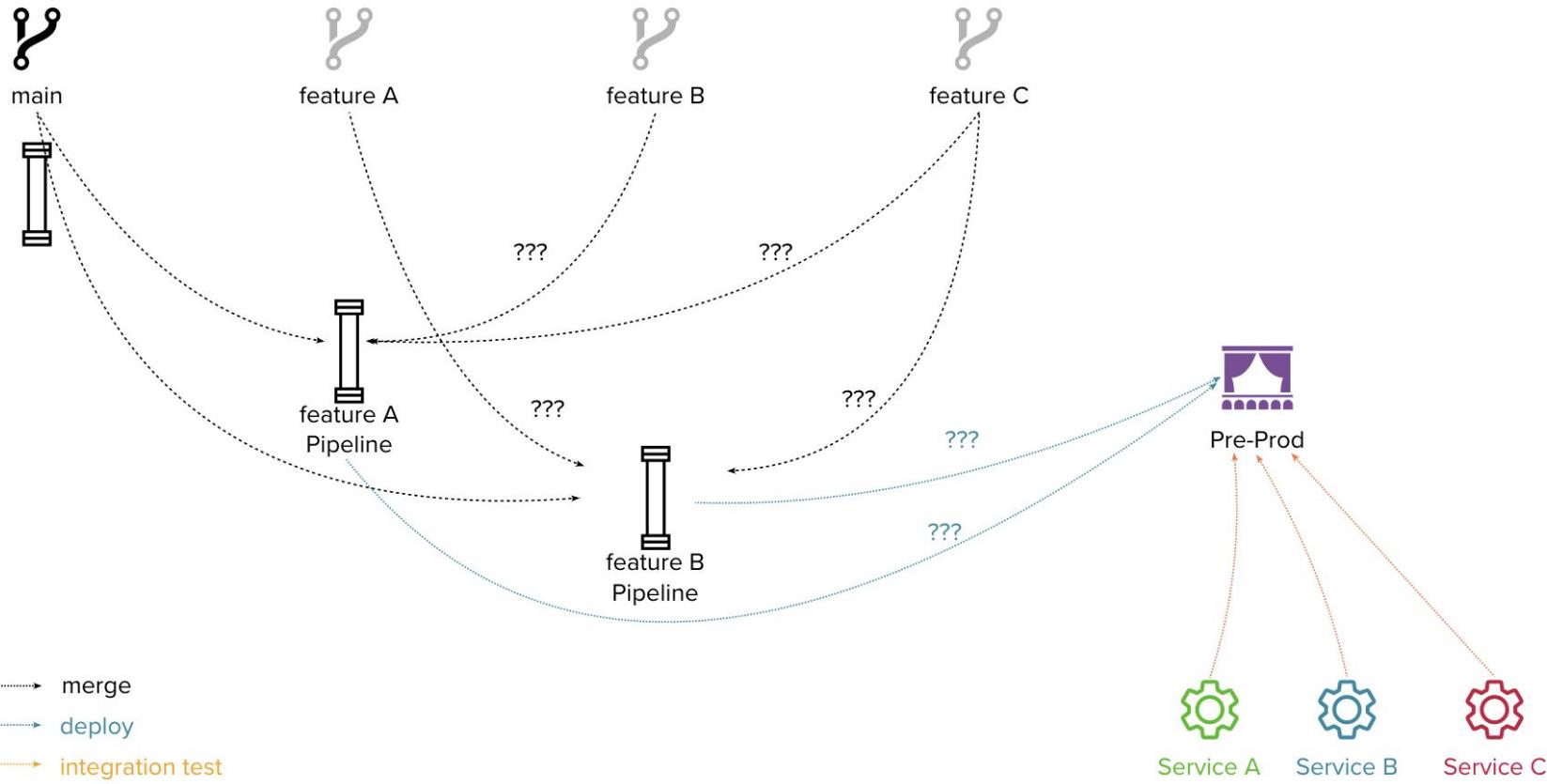
Part I - Trunk-Based Development & CI

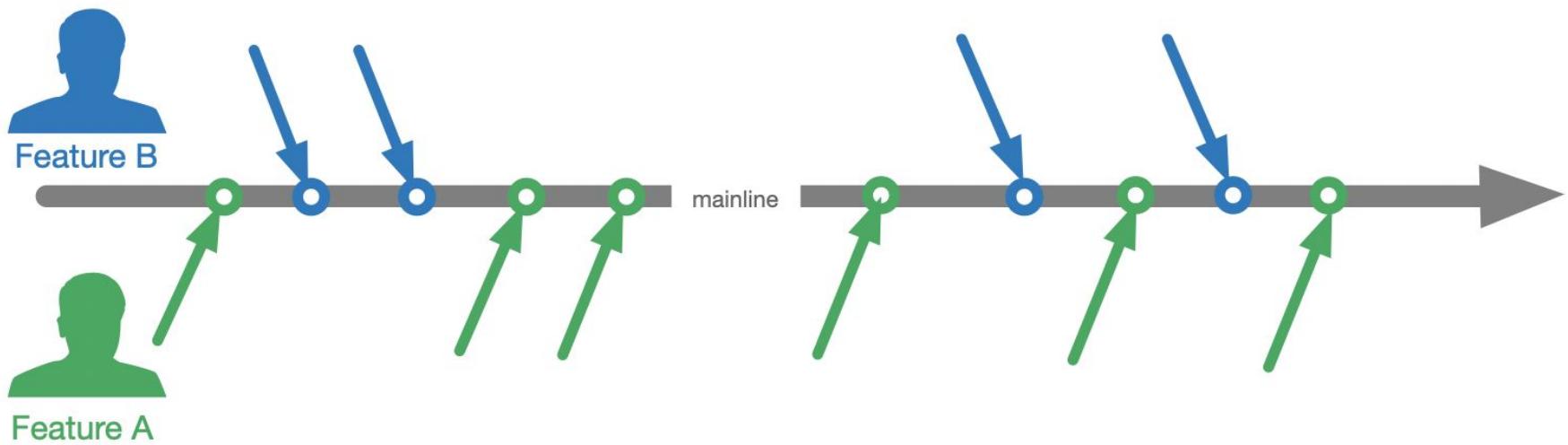
Continuous Integration



Continuous Integration (CI) is a development practice that requires developers to **integrate** code into a shared repository **at least once a day**. Each check-in is then verified by an automated build, allowing teams to **detect problems early**.

Problems with CI-ing feature branches





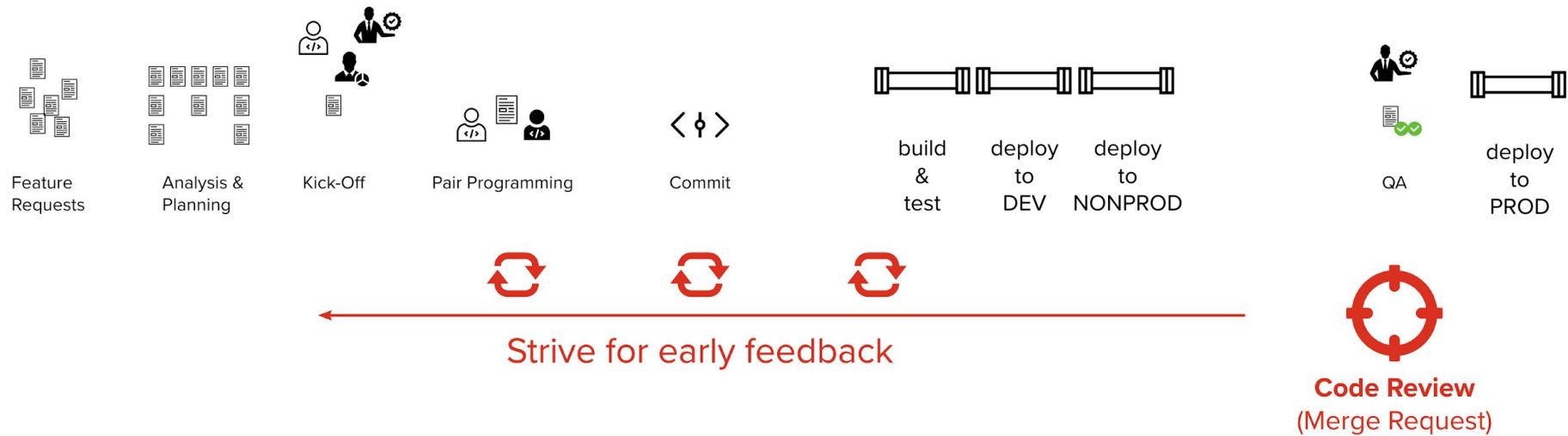
Trunk-based development
is a mandatory prerequisite for
Continuous Integration

ONE DOES NOT SIMPLY

DO TRUNK-BASED DEVELOPMENT

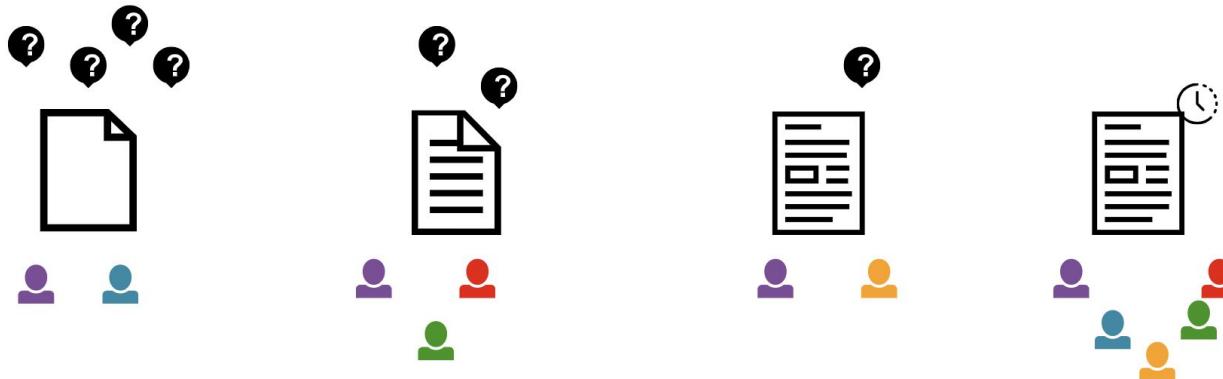
A portrait of Boromir from the Lord of the Rings movies. He has long brown hair and a beard, and is holding a smoking pipe. The background is a warm, golden light.

Support TBD within your workflow

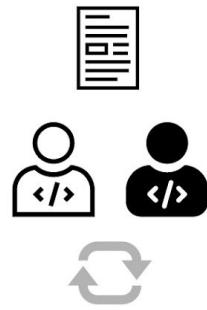


Story-Analysis as a shared responsibility

- Include Client (Business), QA, XD and Devs in the story analysis
- Analyse iteratively
- Assess whether a story is well understood in your estimation sessions
- Have a driver for a story that “anchors” the topic



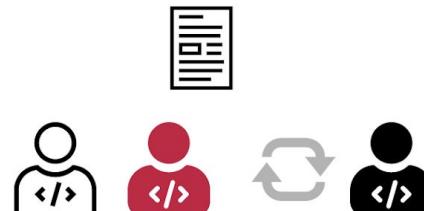
Pair Programming



Rotate Roles



Alternate
Pairing Methods



Rotate People



Reduce Bus Factor



Chris Ford

@ctford

A day's back-and-forthing on a PR
can save you literally minutes of pair
programming.

1:44pm · 2 May 2018 · Twitter Web Client

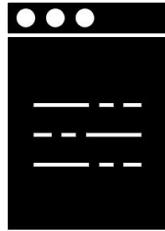
16 Replies **332** Retweets **645** Likes

Trunk-based development
works best supported by other
practices that provide early review

Test-Driven Development



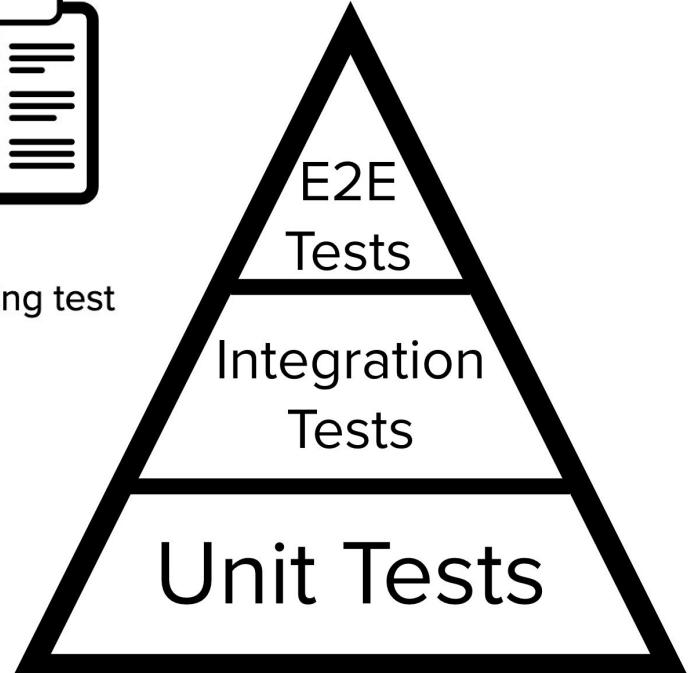
Write a failing test



Write only as much code
to make it pass



Passing test



Continuous Integration - Best Practices



Check in frequently
(at least once a day)



Keep the build fast



Every commit should build on an integration machine



Test in a clone of the production environment



Don't check in broken code



Don't check in untested code



Don't check in when the build is broken



Don't go home after checking in until the system builds

Trunk-based development
requires the adoption of some
technical practices to be safe

Part II - Feature Toggles & CD

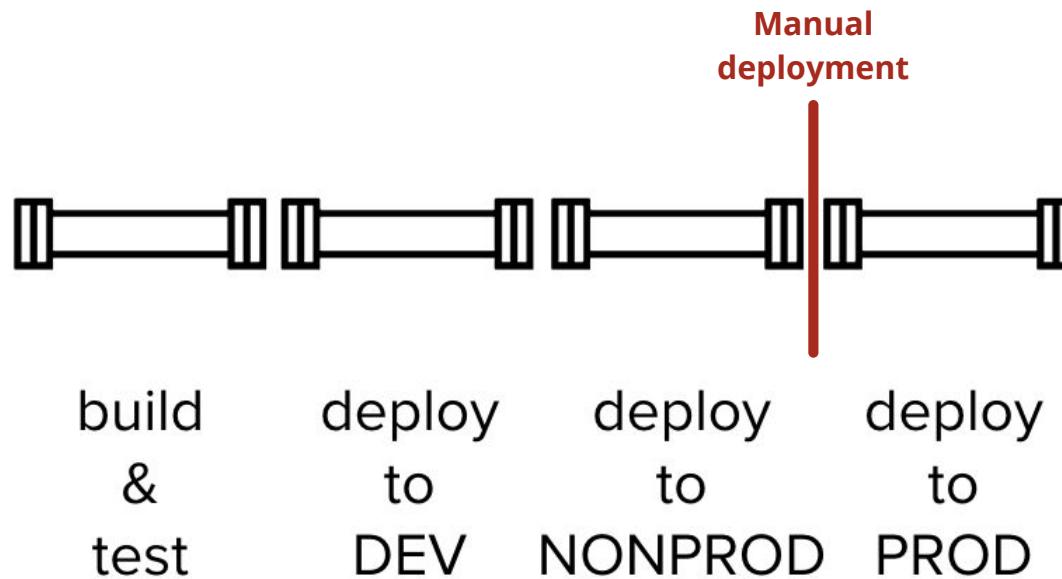
Continuous Delivery



Continuous delivery (CD) is a software engineering approach in which teams produce software in **short cycles**, ensuring that the software can be **reliably released** at any time [...] It aims at **building, testing, and releasing** software with greater speed and frequency.

Wikipedia

What's keeping us from CD?



Continuous Delivery makes **releasing** a
business decision not a technical decision



OFF

MY WEBSITE

ON

MY WEBSITE

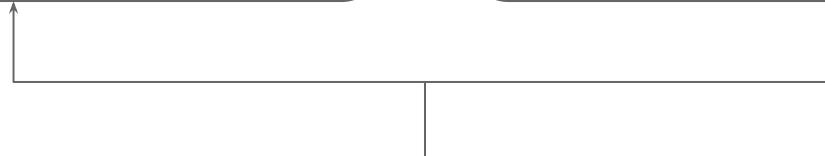
**COOL NEW
FEATURE**

***NON
PROD***

PROD

ON

OFF

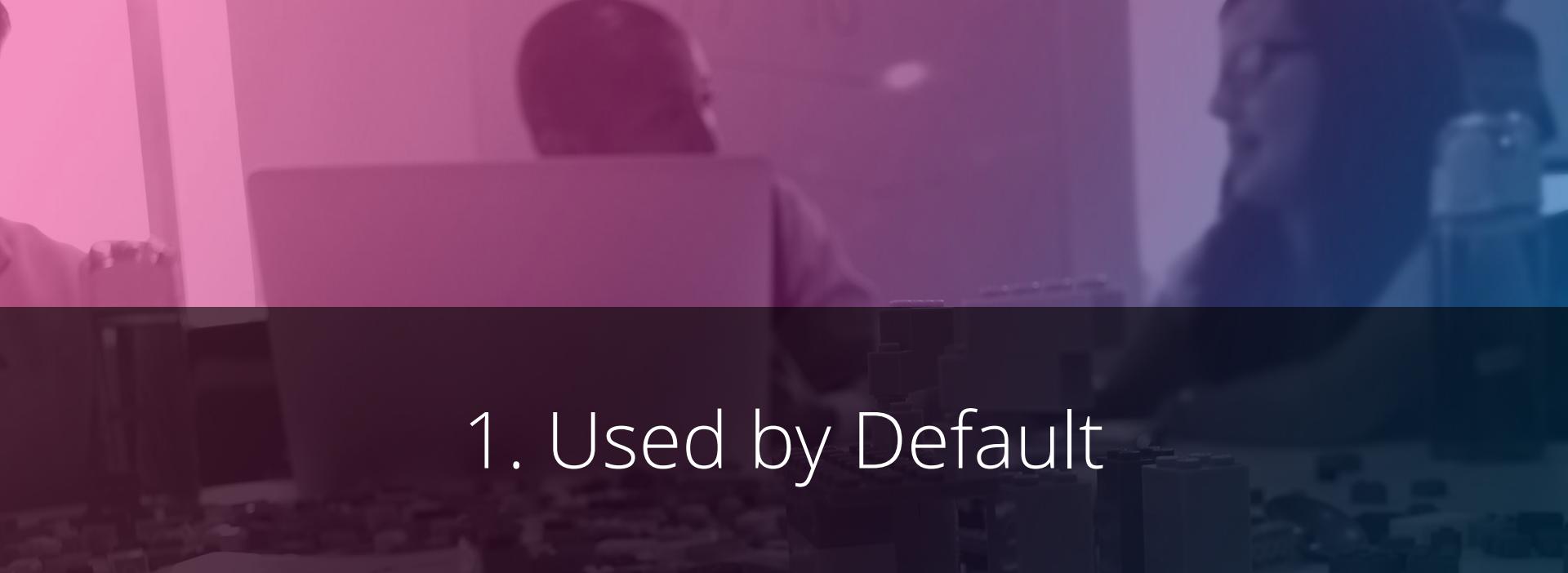


Both are valid states!



GLOBAL SOFTWARE CONSULTANCY

A Feature Toggles Life Cycle



1. Used by Default



READY FOR DEV

#60 New Feature

#62 Bug Fix

#63 Feature Improvement



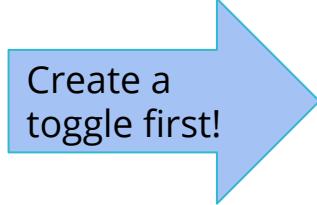
IN DEV

 **READY FOR DEV**

#60 New Feature

#62 Bug Fix

#63 Feature Improvement



Create a
toggle first!

 **IN DEV**

READY FOR DEV

#62 Bug Fix

#63 Feature Improvement

#60 New Feature

Create a toggle first!

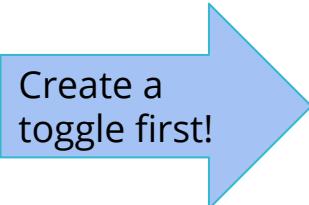
- Usually takes less than 1 hour
- Enable toggle on all non-prod environments 
- Disable toggle on prod environment 

IN DEV

READY FOR DEV

#62 Bug Fix

#63 Feature Improvement



Create a
toggle first!

IN DEV

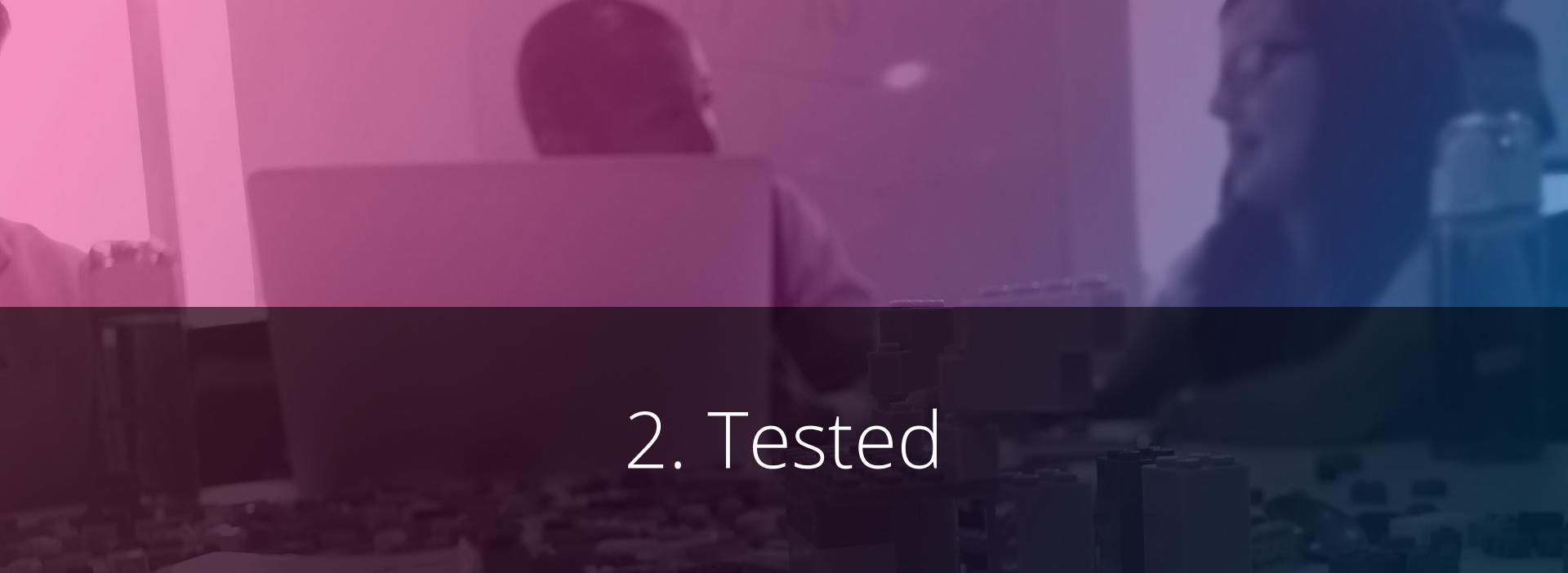
#60 New Feature



- Safe to *deploy* to prod at any time



1. Used by Default: Enable Continuous Delivery



2. Tested

#60 New Feature

T1

T2

T3

T4

T5

#60 New
Feature

Unaffected



#60 New
Feature

Unaffected



#60 New
Feature

Unaffected

T1

T3

T4

ON

Affected

T2

T5

#60 New
Feature

Unaffected

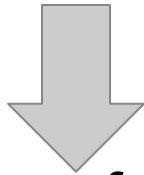
T1

T3

T4

ON

Affected (**legacy**)



Copies of Affected

T2

T5

T2'

T5'

#60 New
Feature

Unaffected

T1

T3

T4

ON

Affected (**legacy**)

T2

T5

OFF

Copies of Affected

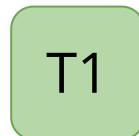
T2'

T5'

ON

#60 New Feature

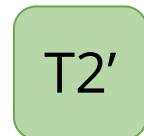
Unaffected



Affected (**legacy**)



Copies of Affected
(delete or adjust)



#60 New Feature

Unaffected

T1

T3

T4

ON

Affected (**legacy**)

T2

T5

OFF

Copies of Affected
(delete or adjust)

T2'

ON

New Tests

© 2021 ThoughtWorks

N1

N2

N3

ON

#60 New
Feature

Done

Unaffected

T1

T3

T4

ON

Affected (**legacy**)

T2

T5

OFF

Copies of Affected
(delete or adjust)

T2'

ON

New Tests

© 2021 ThoughtWorks

N1

N2

N3

ON

#60 New
Feature

Done

Unaffected

T1

T3

T4

ON

Copies of Affected
(delete or adjust)

T2'

ON

New Tests

© 2021 ThoughtWorks

N1

N2

N3

ON

#60 New Feature

Done

Unaffected

T1

T3

T4

ON

Copies of Affected
(delete or adjust)

T2'

ON

New Tests

© 2021 ThoughtWorks

N1

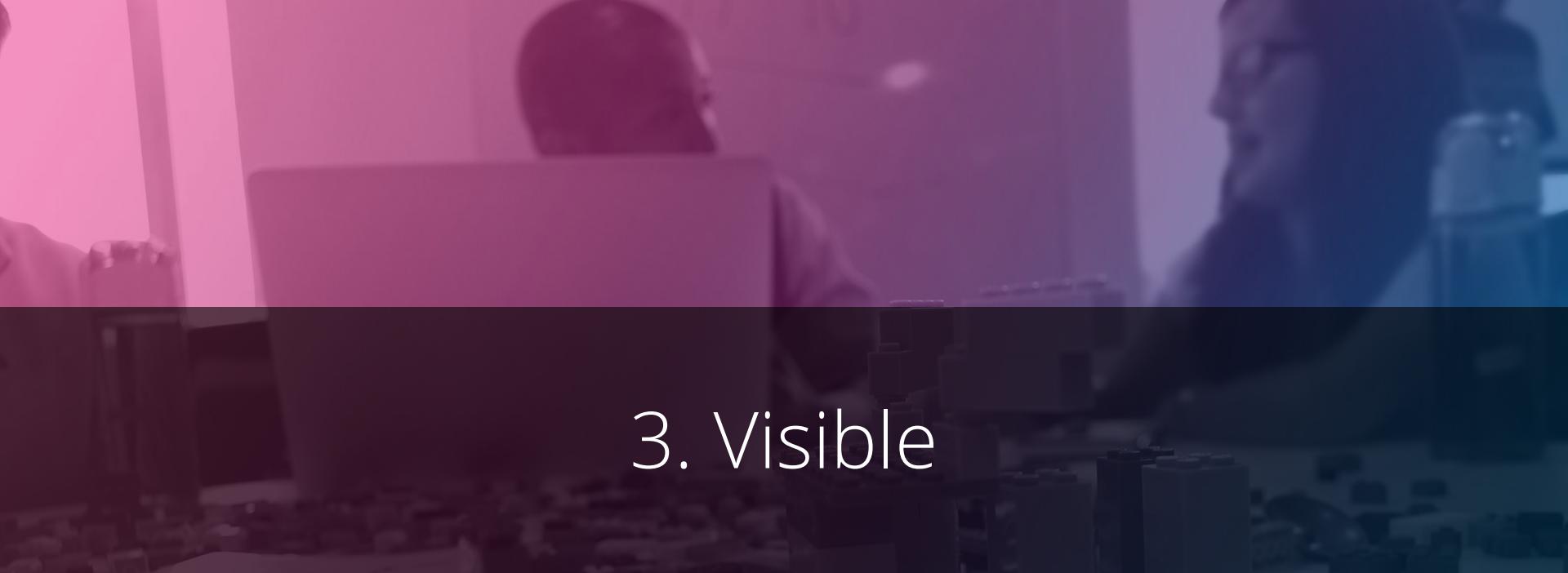
N2

N3

ON



2. Tested: Enable Easy Clean-up



3. Visible



READY FOR SIGN-OFF

#60 New Feature

#57 Fix Login Bug



DONE

#50 German i18n

#51 Sort by Date

#48 New Design for Buttons



READY FOR SIGN-OFF

#60 New Feature

Toggle:
NEW_FEATURE

#57 Fix Login Bug



DONE

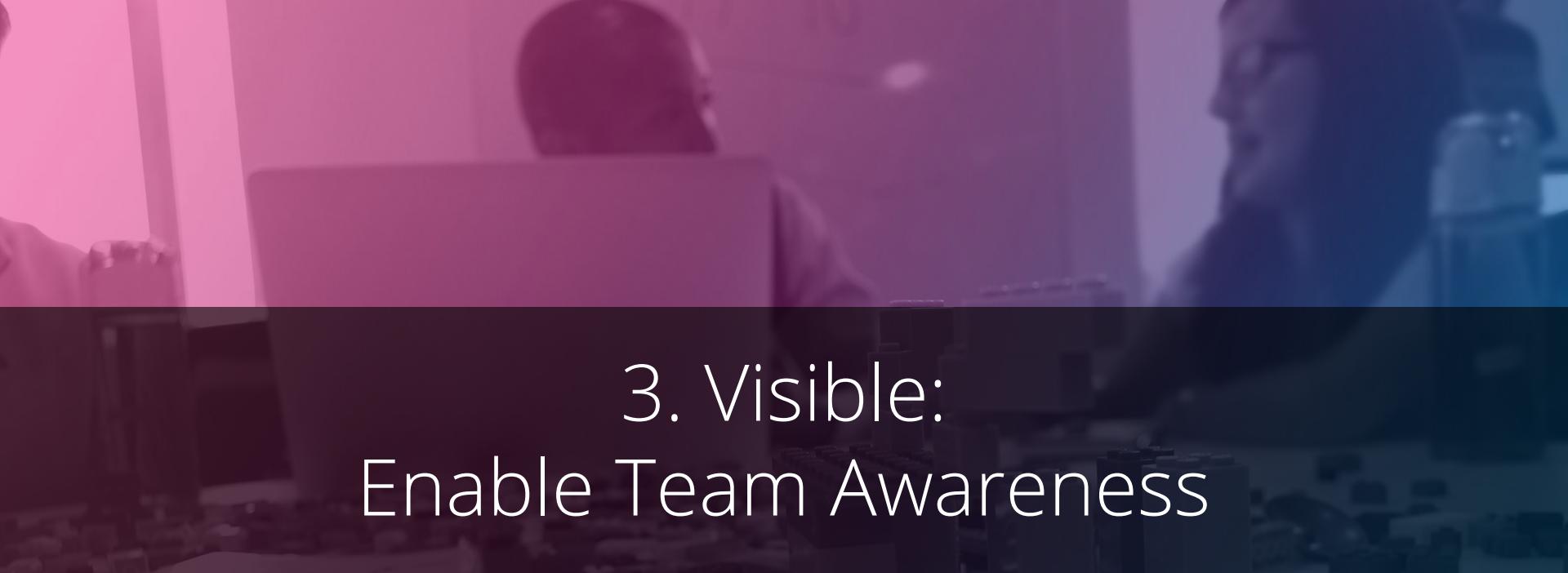
#50 German i18n

#51 Sort by Date

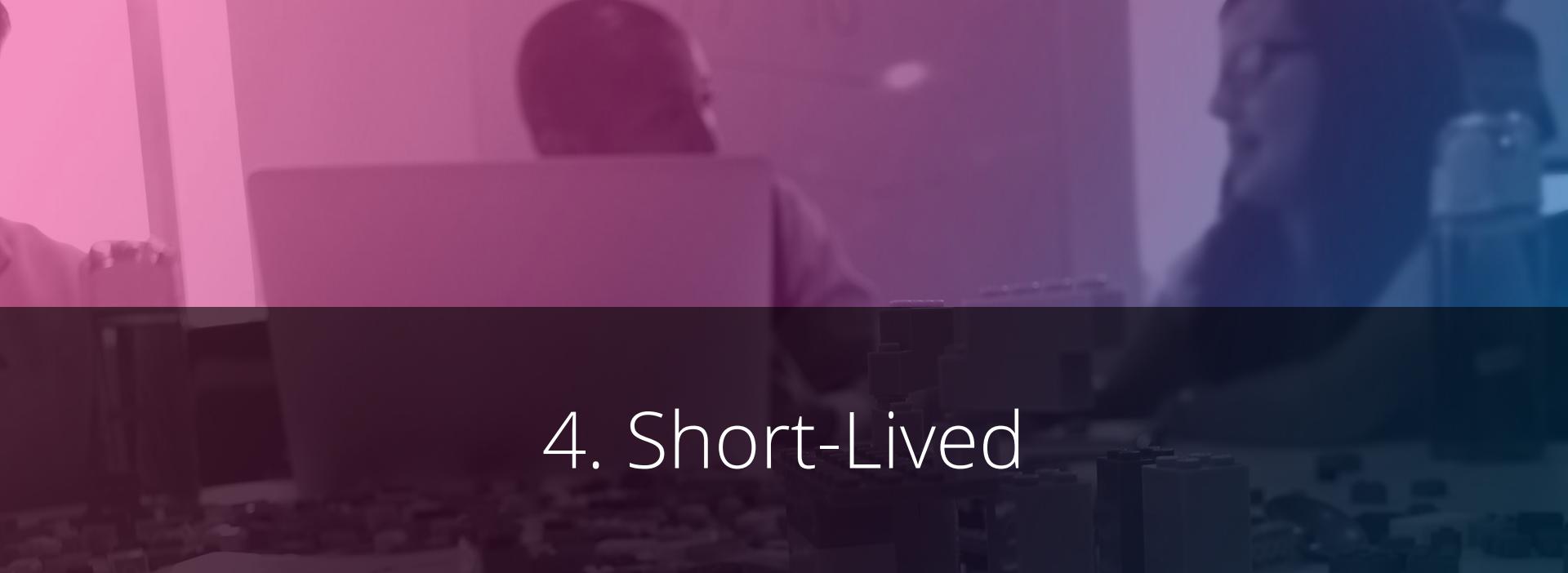
Toggle:
SORT_DATA

#48 New Design for Buttons

Toggle:
UI_BUTTONS



3. Visible: Enable Team Awareness



4. Short-Lived



READY FOR SIGN-OFF

#60 New Feature

Toggle:
NEW_FEATURE

#57 Fix Login Bug



DONE

#50 German i18n

#51 Sort by Date

Toggle:
SORT_DATA

#48 New Design for Buttons

Toggle:
UI_BUTTONS



READY FOR SIGN-OFF

#60 New Feature

Toggle:
NEW_FEATURE

#57 Fix Login Bug

➔ PROD/TOGGLED ON

DONE

#50 German i18n

Toggle:
SORT_DATA

#51 Sort by Date

Toggle:
UI_BUTTONS

#48 New Design for Buttons



READY FOR SIGN-OFF

#60 New Feature

Toggle:
NEW_FEATURE

#57 Fix Login Bug

➔ PROD/TOGGLED ON

#51 Sort by Date

Toggle:
SORT_DATE

#48 New Design for Buttons

Toggle:
UI_BUTTONS



DONE

#50 German i18n



READY FOR SIGN-OFF

#60 New Feature

Toggle:
NEW_FEATURE

#57 Fix Login Bug

→ PROD/TOGGLED ON

#51 Sort by Date

Toggle:
SORT_DATE
Remove on:
June 25th

#48 New Design for Buttons

Toggle:
UI_BUTTONS
Remove on:
June 23rd



DONE

#50 German i18n

TOGGLES IN EXISTENCE

NEW_FEATURE

SORT_DATE

UI_BUTTONS

SORT_PRICE

READY FOR SIGN-OFF

#60 New Feature

Toggle:
NEW_FEATURE

#57 Fix Login Bug

PROD/TOGGLED ON

#51 Sort by Date

Toggle:
SORT_DATE
Remove on:
June 25th

#48 New Design for Buttons

Toggle:
UI_BUTTONS
Remove on:
June 23rd

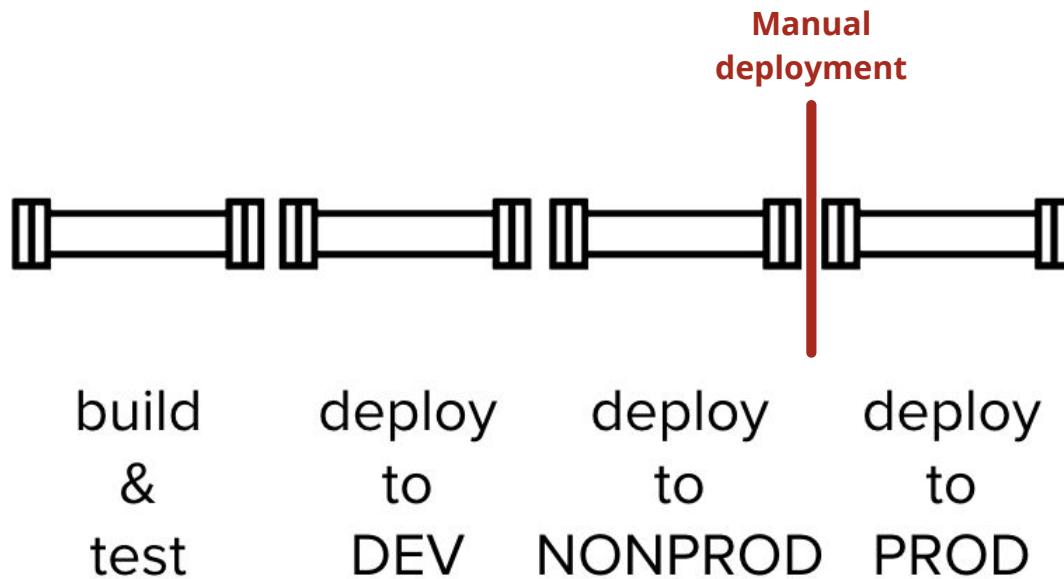
DONE

#50 German i18n

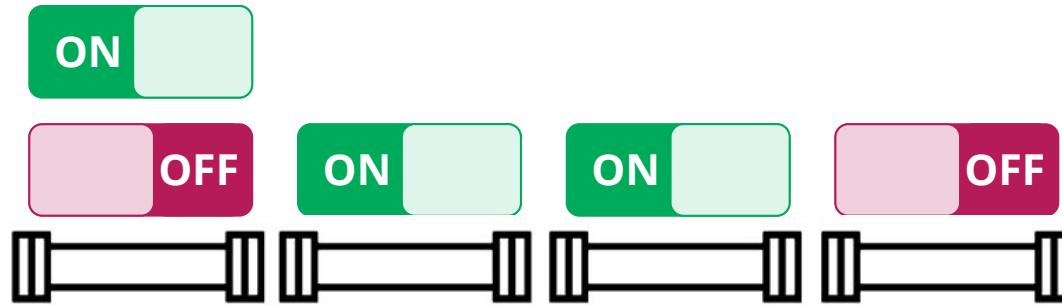


4. Short-Lived: Reduce Tech Debt

Enable Continuous Delivery with Feature Toggles



Enable Continuous Delivery with Feature Toggles



build deploy deploy deploy
& to to to
test DEV NONPROD PROD

[Continuous Delivery](#) [Technology](#)

Managing feature toggles in teams



[Paul Börding](#)



[Steve Upton](#)

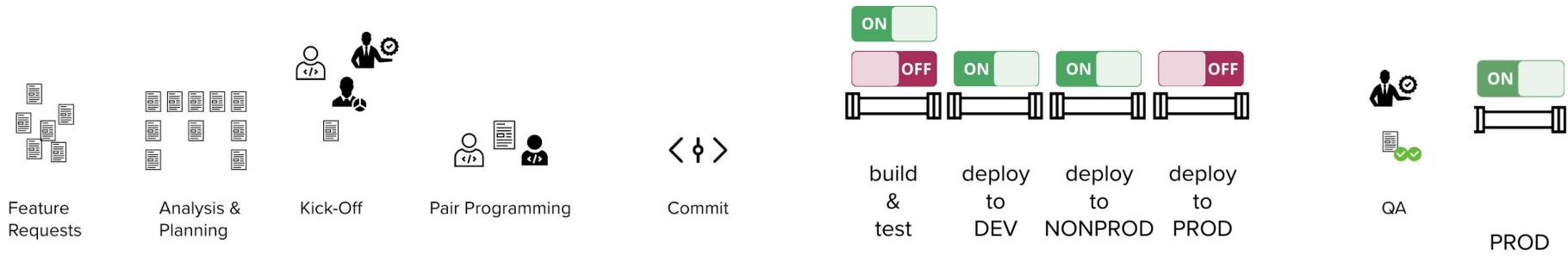
Published: Aug 26, 2020

<https://www.thoughtworks.com/insights/blog/managing-feature-toggles-teams>

<https://youtu.be/6e88toloUiU>

Summary

Achieve Continuous Delivery



Continuous Integration Certification

1. **Every developer** commits to a **shared mainline** (trunk) at **least daily**
2. Every commit to mainline **triggers an automated test and build**
3. If the build or test fails, it is **fixed in 10 minutes**

Continuous Delivery Certification

Is **releasing** a feature a **business decision** or a **technical decision**?



Questions & Discussion

Resources

References

- <https://www.thoughtworks.com/insights/blog/managing-feature-toggles-teams>
- <https://infrastructure-as-code.com/book/2021/01/02/pull-requests.html>
- <https://trunkbaseddevelopment.com/>
- <https://www.thoughtworks.com/de/continuous-integration>
- <https://www.martinfowler.com/articles/continuousIntegration.html>
- <https://martinfowler.com/articles/branching-patterns.html>
- <https://itrevolution.com/the-devops-handbook/>
- <https://itrevolution.com/book/accelerate/>
- <https://lihsmi.ch/meetup/2021/01/21/q-and-a-trunk-based-development.html>

THANKYOU

Michael Lihs
@kaktusmimi

michael.lihs@thoughtworks.com

Paul Börding
@PaulB5g

paul.boerding@thoughtworks.com

ThoughtWorks®