



MICHIEL ROOK

# THE ROAD TO CONTINUOUS DEPLOYMENT – A CASE STUDY

@michieltcs



- ▶ Developer, consultant, trainer, speaker
- ▶ @michieltcs











# Large aging monolith



Large aging monolith



Generates income

Large aging monolith



Generates income

Slow & complex

Large aging monolith

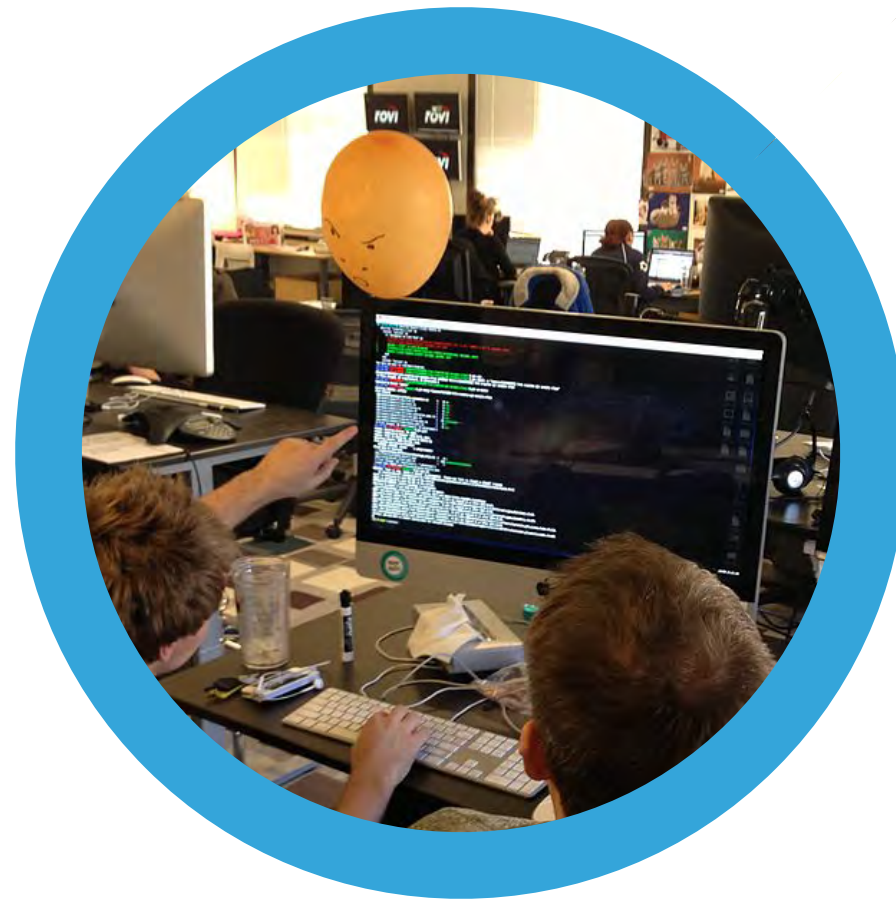
Technical debt



Generates income

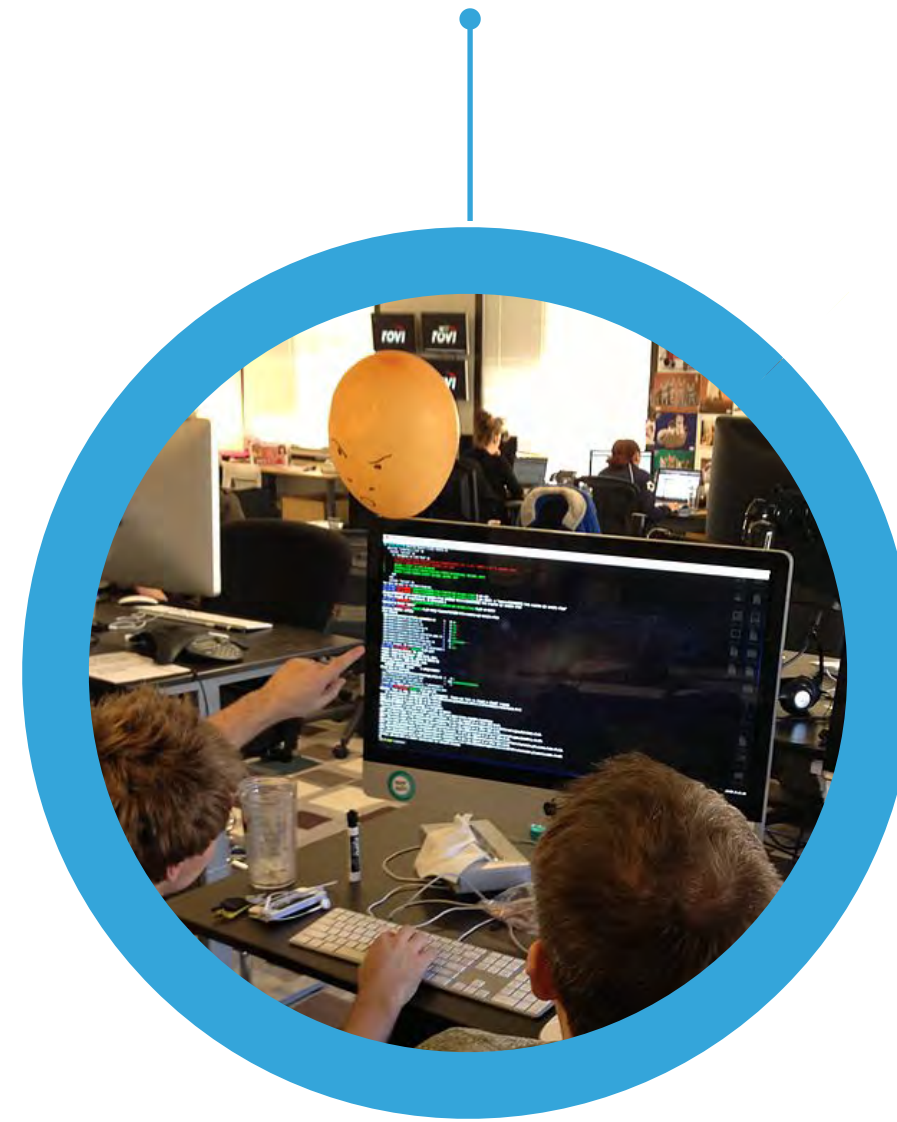
Slow & complex





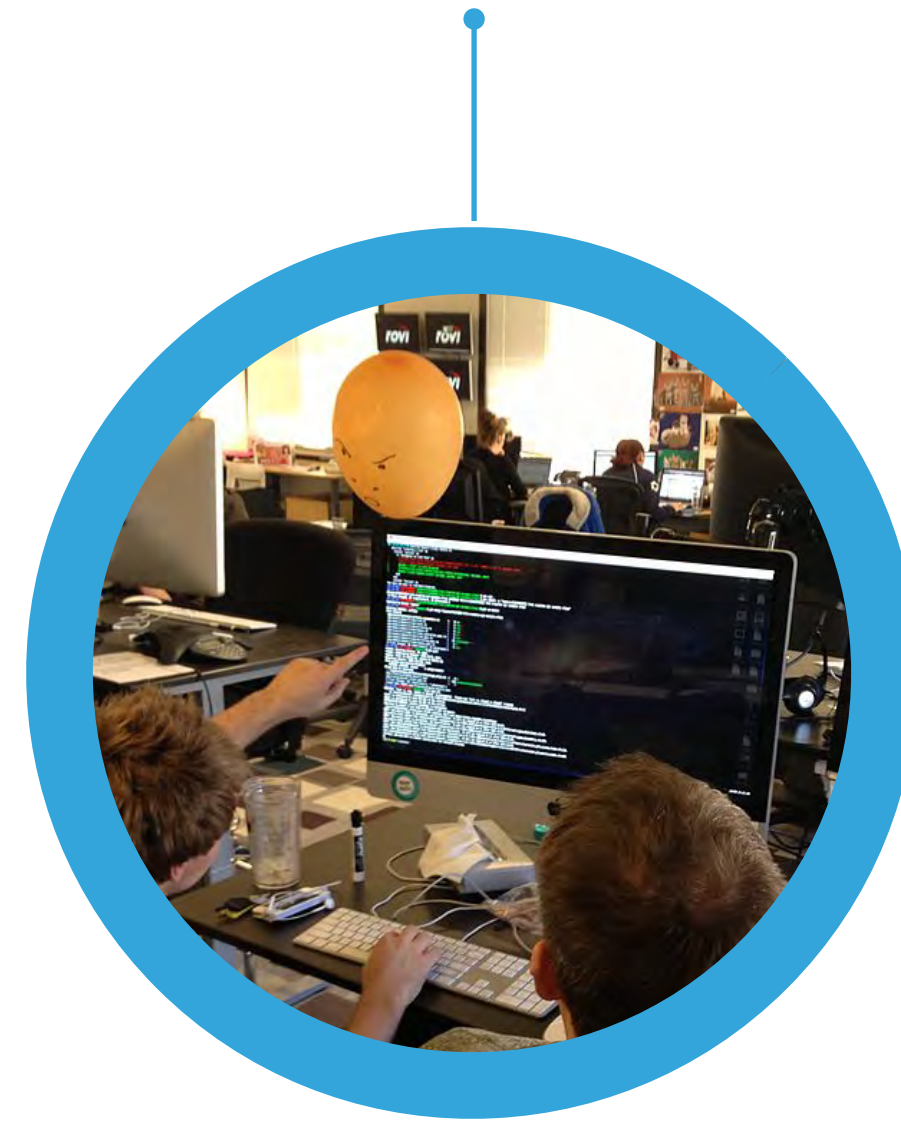


# Manual releases





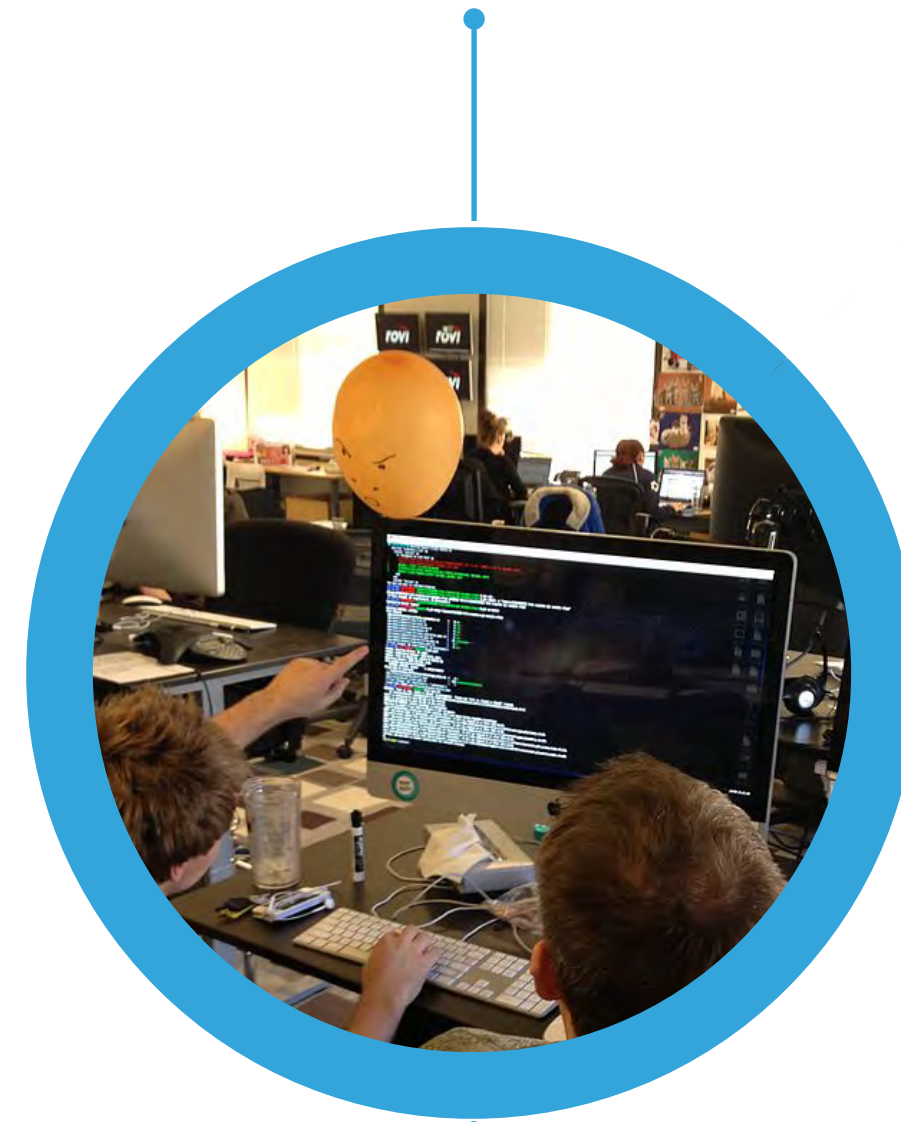
Manual releases



Fragile tests

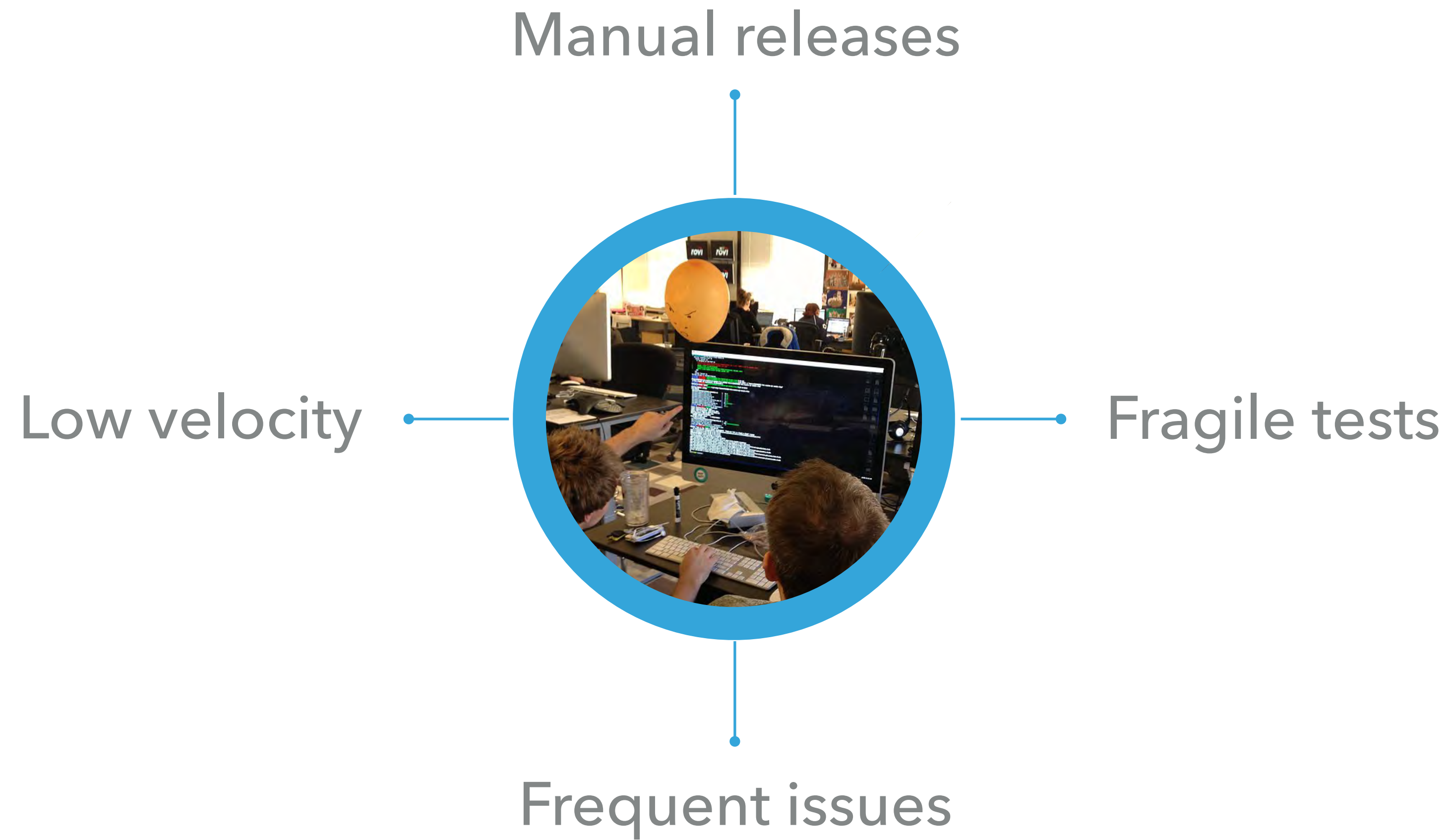


Manual releases



Fragile tests

Frequent issues





# GOALS

# GOALS

1

**REDUCE  
ISSUES**



# GOALS

1

**REDUCE  
ISSUES**

2

**REDUCE  
LEAD TIME**

# GOALS

1

**REDUCE  
ISSUES**

2

**REDUCE  
LEAD TIME**

3

**INCREASE  
PRODUCTIVITY**



# GOALS

1

**REDUCE  
ISSUES**

2

**REDUCE  
LEAD TIME**

3

**INCREASE  
PRODUCTIVITY**

4

**INCREASE  
MOTIVATION**

**REFACTOR? REBUILD?**

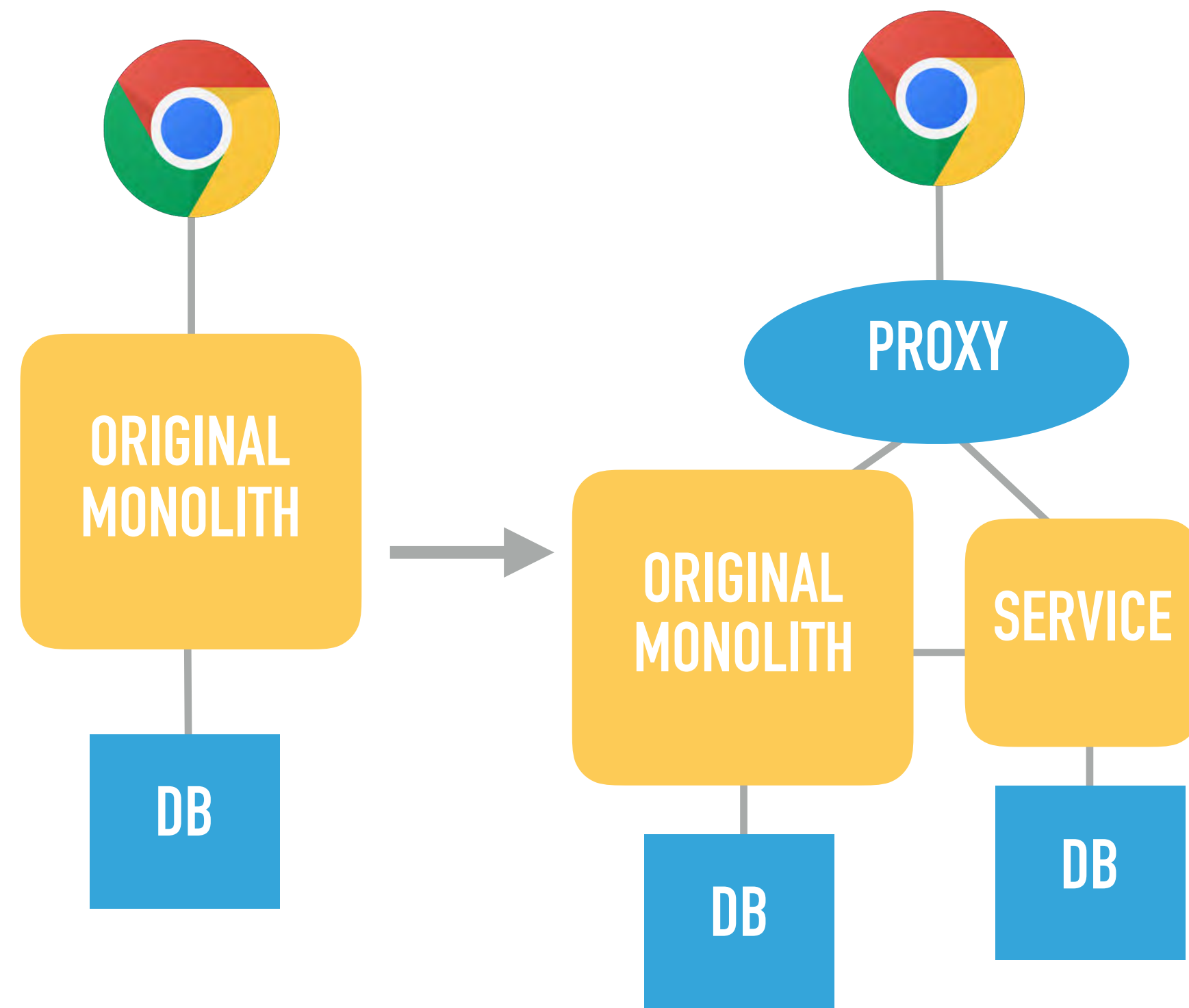
# APPROACH

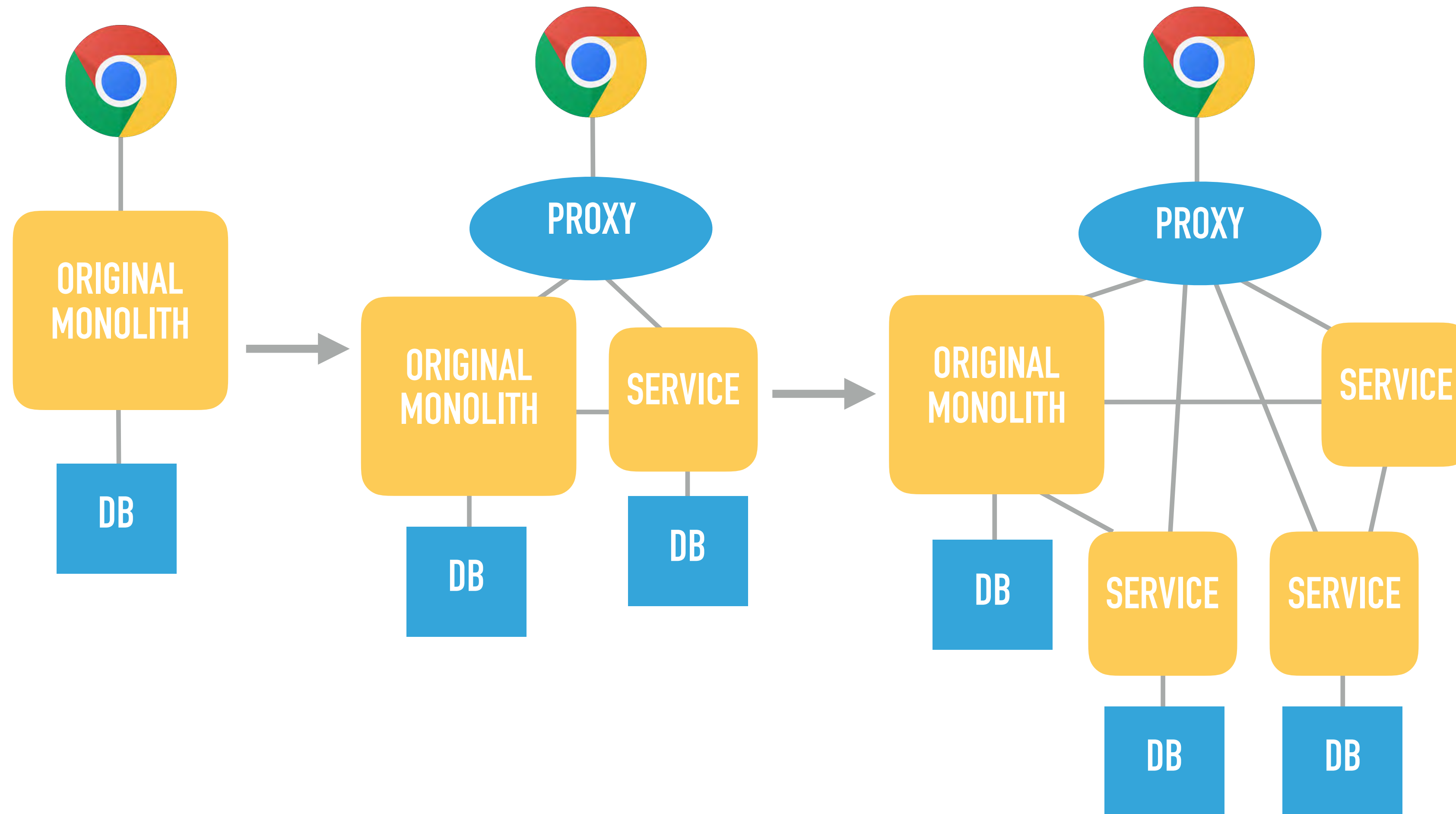
- ▶ API first
- ▶ Services per domain object  
(job, jobseeker, ...)
- ▶ Migrate individual pages













# ARCHITECTURE

**FRONTENDS  
ARE SERVICES**

# ARCHITECTURE

**FRONTENDS  
ARE SERVICES**

**SERVICES  
BEHIND LOAD  
BALANCERS**

# ARCHITECTURE

FRONTENDS  
ARE SERVICES

SERVICES  
BEHIND LOAD  
BALANCERS

ACCESS LEGACY  
DB'S



# ARCHITECTURE

FRONTENDS  
ARE SERVICES

SERVICES  
BEHIND LOAD  
BALANCERS

ACCESS LEGACY  
DB'S

SERVICES IN  
CONTAINERS



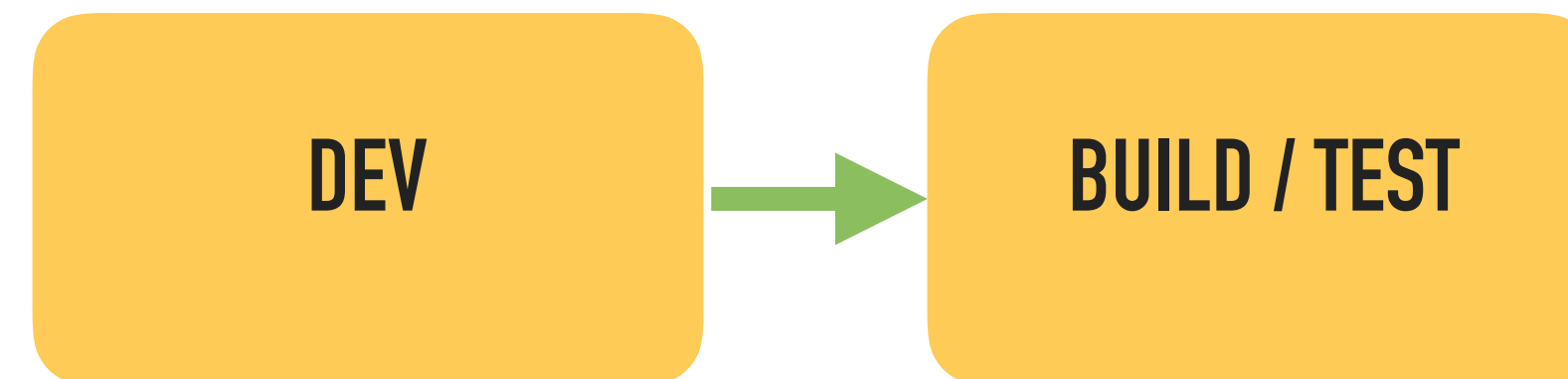


**IMPROVING**



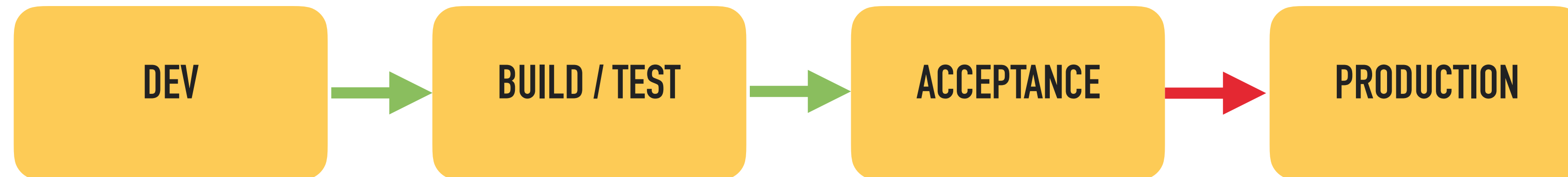
**CONTINUOUS EVERYTHING**

# CONTINUOUS INTEGRATION

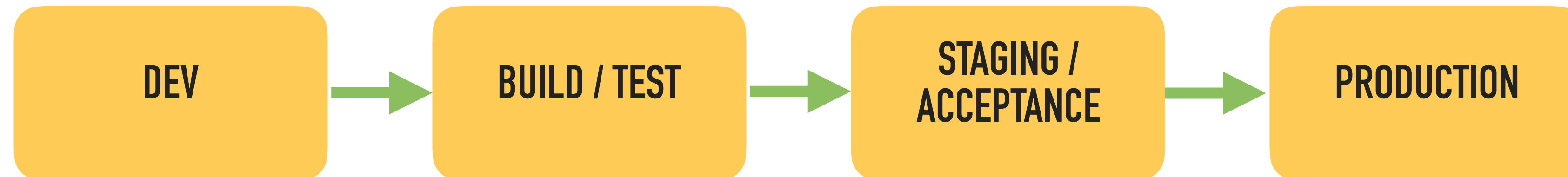




# CONTINUOUS DELIVERY



# CONTINUOUS DEPLOYMENT



**EVERY COMMIT GOES TO  
PRODUCTION**

IF IT HURTS  
DO IT MORE OFTEN



**SMALL STEPS**

**SMALL STEPS**

**EARLY  
FEEDBACK**

**SMALL STEPS**

**EARLY  
FEEDBACK**

**REDUCE TIME  
TO RECOVER**

**SMALL STEPS**

**EARLY  
FEEDBACK**

**REDUCE TIME  
TO RECOVER**

**EXPERIMENTS!**



# CHANGES IN IT PERFORMANCE OF HIGH PERFORMERS

IT performance metrics	2016	2017
Deployment frequency	200x more frequent	46x more frequent
Lead time for changes	2,555x faster	440x faster
Mean time to recover (MTTR)	24x faster	96x faster
Change failure rate	3x lower (1/3 as likely)	5x lower (1/5 as likely)

Source: 2017 State Of DevOps report

**ONLY COMMIT TO MASTER**

**NO BRANCHES**

**NO BRANCHES**

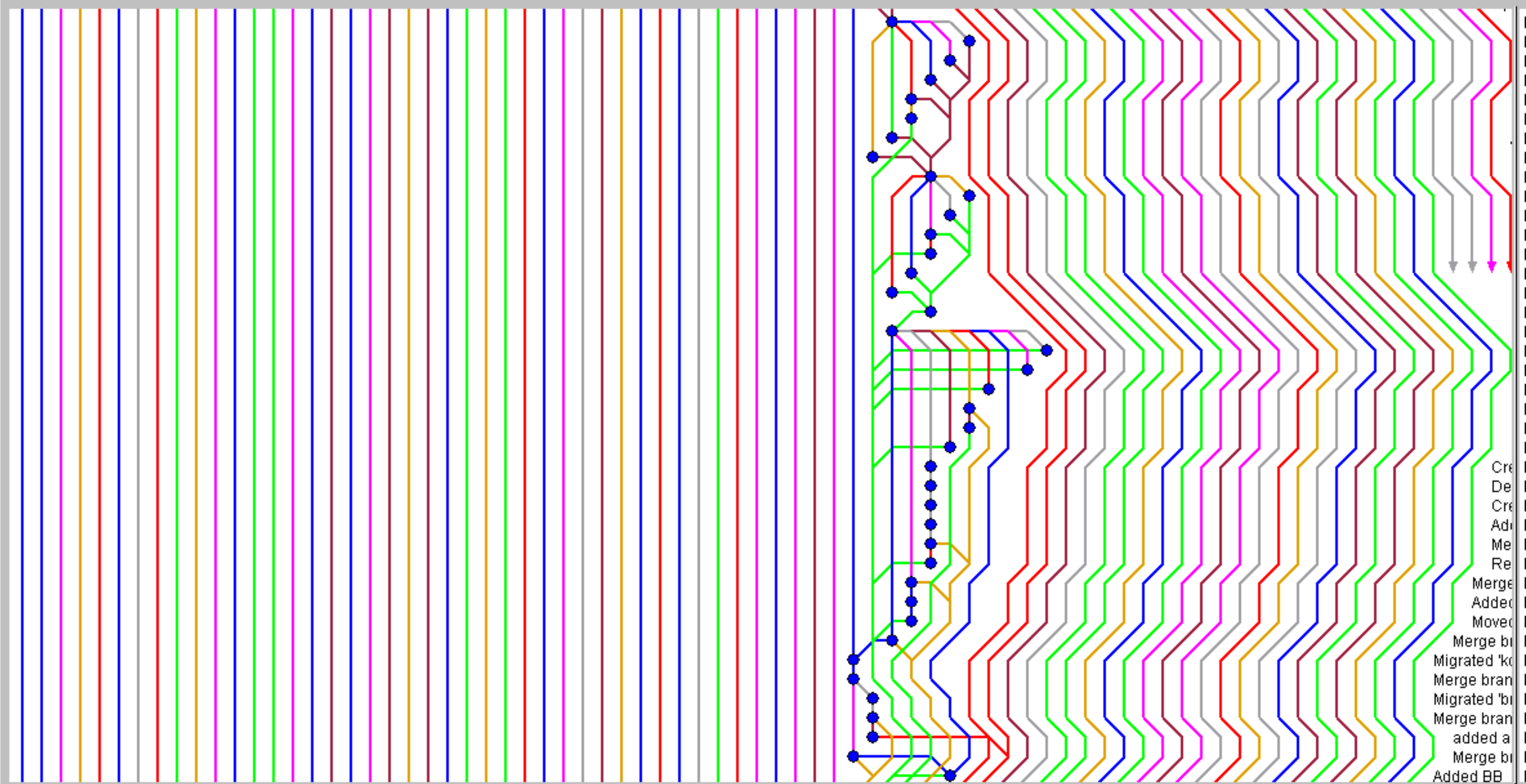
**REALLY.**





**SHORT LIVED FEATURE  
BRANCHES?**





Cre  
De  
Cre  
Ad  
Me  
Re  
Merge  
Add  
Move  
Merge b  
Migrated 'k  
Merge bran  
Migrated 'b  
Merge bran  
added a  
Merge b  
Added BB

SHA1 ID: b8dc17c5985b57fab756ad950f70072283681864

← → Find

Exact

**DELAYING INTEGRATION**

**CONFLICTS**



# FEATURE TOGGLES

**DECOUPLE DEPLOYMENTS  
FROM RELEASES**

zoek in vacatures stages bijbanen

wat 
 waar 
30km
zoek

[uitgebreid zoeken](#)

[vacatures bladeren](#) > [vacatures ICT](#) > Noord-Holland

### ICT vacatures in Noord-Holland

277 Vacatures gevonden. Online zoeken naar vacatures, banen en werk in de branche ICT. Personeel gezocht: Nationalevacaturebank.nl is de vacaturebank met het meest complete aanbod van LBO, MBO, HBO en universitaire vacatures en jobs met een vast of deeltijd dienstverband.



**1e lijn NOC Engineer** 25-09-2013 36 - 40 uur  
**Technicum Telecom Noord** Hoofddorp MBO

Als NOC engineer verzorg je de 1e lijns support richting onze wholesale klanten met betrekking tot hun IP, voice en Televisiediensten. ? Als NOC operator ben je verantwoordelijk voor het pro- en reactief monitoren van het glasvezelnetwerk, IPTV ...

**1e lijn NOC Engineer** 25-09-2013 36 - 40 uur  
**Technicum Telecom Zuid-West** Hoofddorp MBO

Als NOC engineer verzorg je de 1e lijns support richting onze wholesale klanten met betrekking tot hun IP, voice en Televisiediensten. ? Als NOC operator ben je verantwoordelijk voor het pro- en reactief monitoren van het glasvezelnetwerk, IPTV ...

**ICT System Administrator** 25-09-2013 40 - 40 uur  
**PEAK-IT** Haarlem MBO

Wil je als ervaren ICT professional onderdeel uitmaken van een inspirerend team en je carrière een nieuwe impuls geven met uitdagende opdrachten? Dan is PEAK-IT jouw volgende werkgever. Als System Administrator ben je verantwoordelijk voor het be...

**Doorgewinterde C++ / PHP Developer gezocht!...** 25-09-2013 40 - 40 uur  
**Star Apple** Amsterdam HBO

Als Architect/Senior C++/PHP Developer sta je aan het roer van een grootschalige migratie. Een groot deel van de inhouse ontwikkelde software waar inmiddels zo&apostn 10 jaar aan gewerkt is

Vind je nieuwe baan

+0 km
Zoeken

Bladeren / [ICT vacatures](#) / [Vacatures in Noord-Holland](#)

- > Plaatsingsdatum
- > Functiegroep
- > Branche
- > Carrièreniveau
- > Opleidingsniveau
- > Dienstverband
- > Uren
- > Geplaatst door

## ICT vacatures in Noord-Holland


**523 vacatures gevonden.** Online zoeken naar vacatures, banen en werk in de branche ICT in de provincie / regio Noord-Holland. Personeel gezocht: Nationalevacaturebank.nl is de vacaturebank met het meest complete aanbod van LBO, MBO, HBO en universitaire vacatures en jobs met een vast of deeltijd dienstverband.

Delen 0
 Tweeten
 Delen
 G+ 0

**Proces Controller**  
**BinckBank** - Amsterdam

Als Proces Controller bij BinckBank ben jij verantwoordelijk voor het op orde houden van bestaande ICT processen. In het kader van het proces management van ICT borg je dat processen bijgewerkt blijven en dat proces risico's beheerd...


32 dagen geleden geplaatst | 40 uur | HBO



**Teamleider**  
**Keylane** - Naarden

De teamleider maakt onderdeel uit van één of meerdere implementatieprojecten bij Keylane. Als teamleider ben je daarin als meewerkend voorman/vrouw verantwoordelijk voor de technische werkzaamheden bij de implementatie van onze


15 dagen geleden geplaatst | 36 - 40 uur | HBO



**Technisch Manager GIS**  
**CGI** - Hoofddorp

"Gezocht: (technisch) manager van ons internationale access en directory management team." Wat ga je doen? Als manager van ons global team voor access en directory management team leidt jij een team van gedreven professionals in

17 dagen geleden geplaatst | 32 - 40 uur | HBO



**FEATURE TOGGLE DEBT**

**CODE REVIEWS?**





# PAIR PROGRAMMING

# CONTINUOUS INLINE CODE REVIEW



A photograph of a window with a blue frame and a silver mesh screen. The screen is broken in the center, with a jagged hole and a dark object protruding from it. The window is set in a rusted metal frame. The text "BOY SCOUT RULE" is overlaid in large, white, bold, sans-serif font across the bottom half of the image.

**BOY SCOUT RULE**



**DEVOPS**

**DEVSECOPS**



**DEVSECQAOPS**

DEVSECQABIZOPS

**DEVSECQABIZNETOPS**

**DEVSECQABIZSYSNETOPS**

DEVTESTSECQABIZSYSNET**OPS**



DEV\*OPS

**TEAM BUILDS IT**

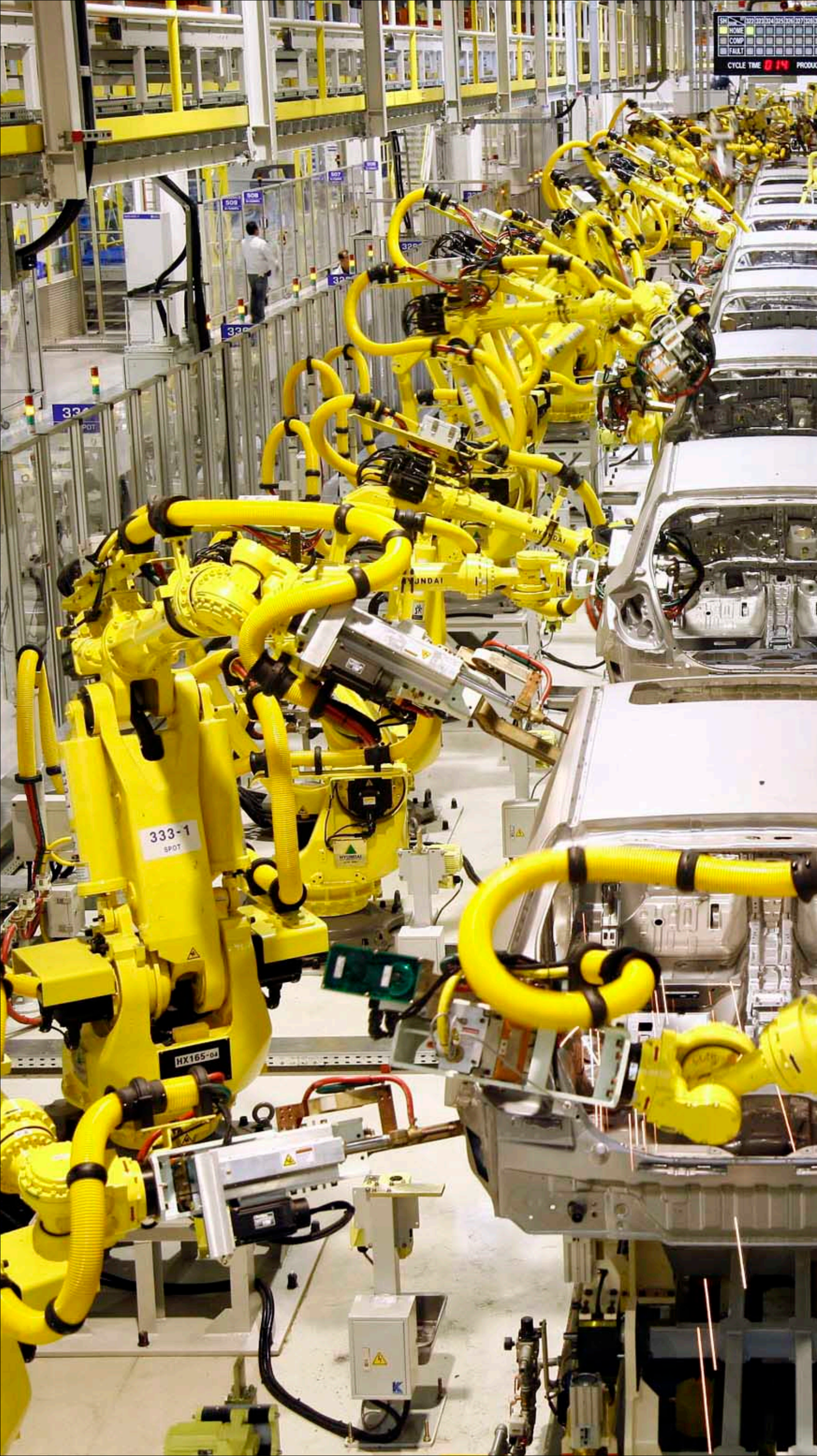
**TEAM RUNS IT**

**TEAM IMPROVES IT**



**TEAM IS RESPONSIBLE**





**BUILD PIPELINE**



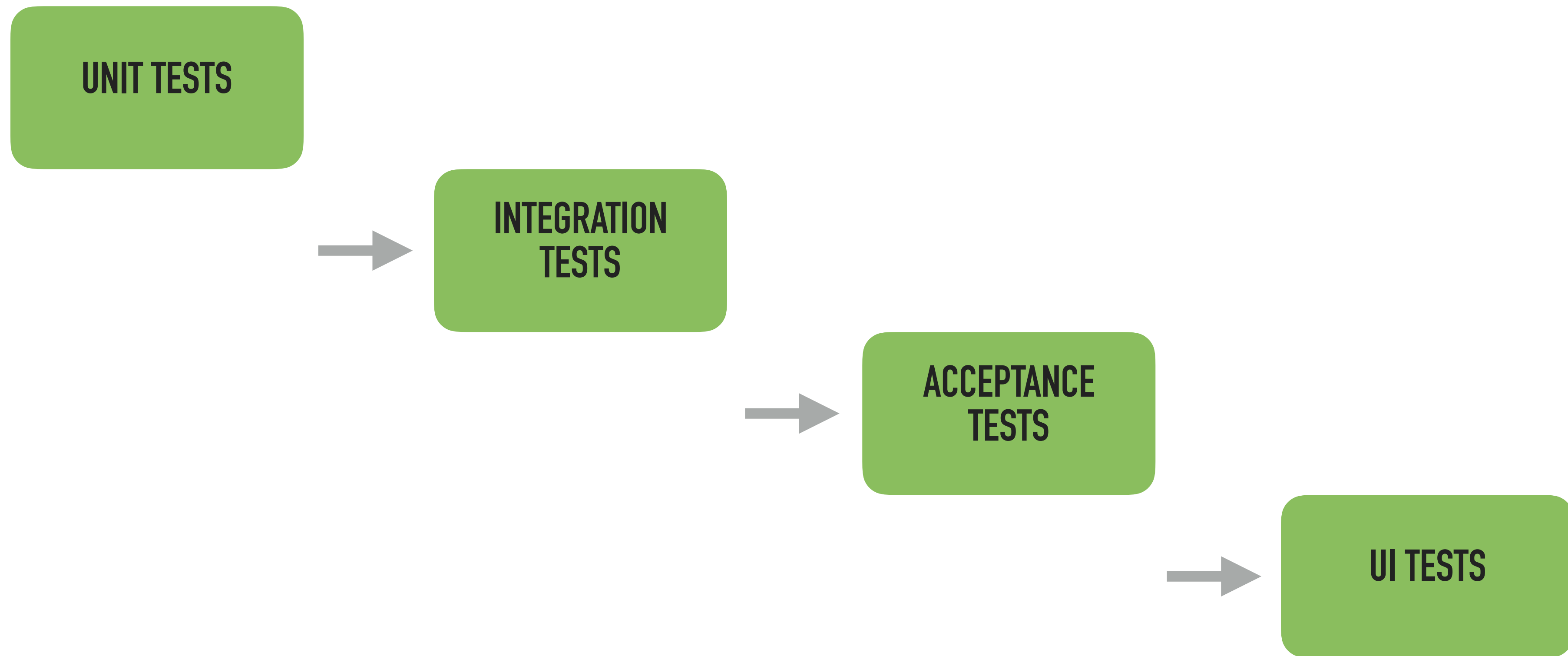
**AUTOMATE REPEATABLE THINGS**

# CONTINUOUS TESTING



**CONFIDENCE**

# DEFENSE IN DEPTH



# DEFENSE IN DEPTH

UNIT TESTS



INTEGRATION TESTS

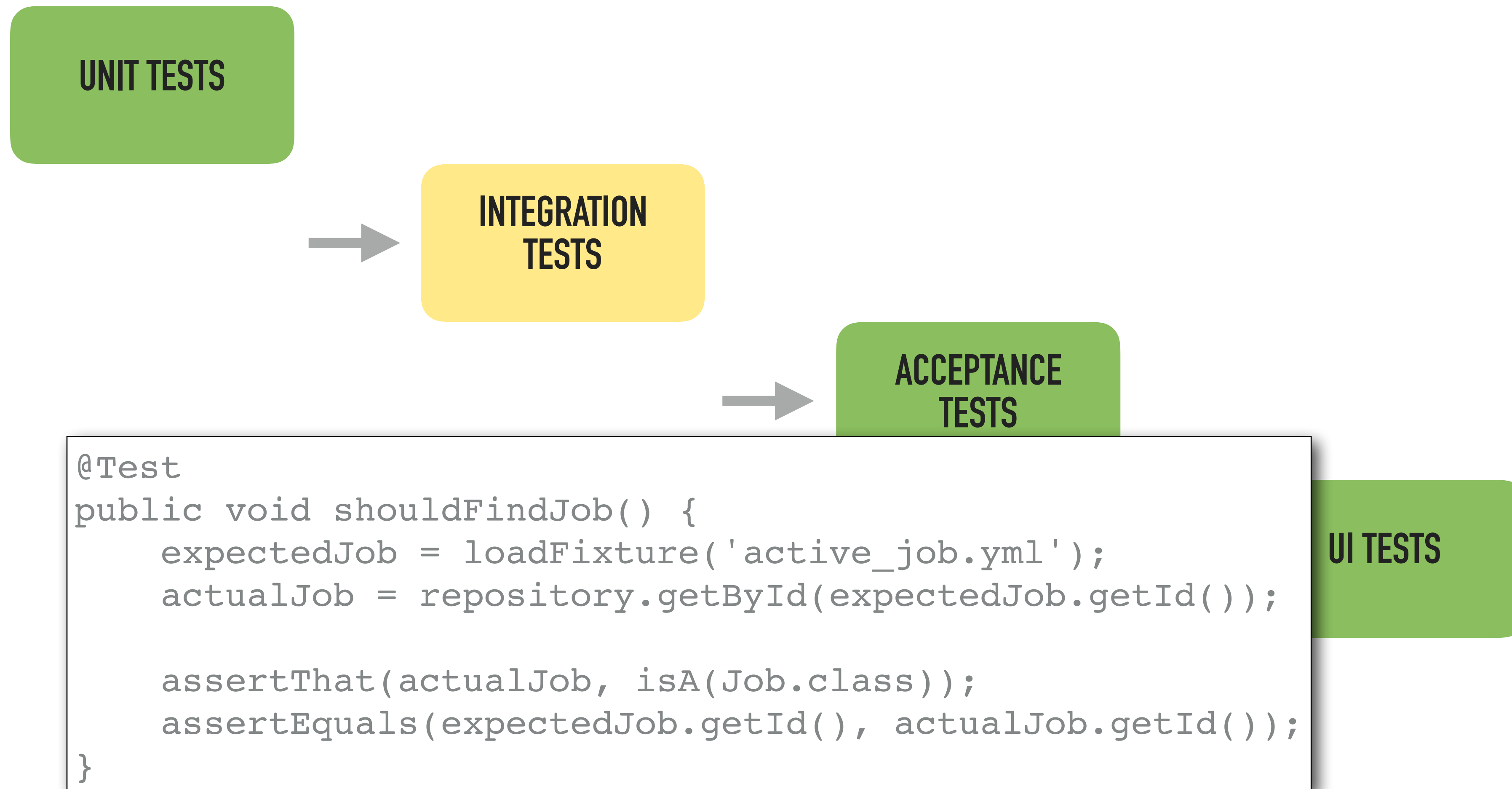
```
@Test
public void jobCannotBeFound() {
    when(jobRepository.getById(EXPECTED_JOB_ID))
        .thenReturn(null);

    JobService jobService = new JobService(jobRepository);

    assertNull(jobService.getById(EXPECTED_JOB_ID));
    verify(jobRepository).getById(EXPECTED_JOB_ID);
}
```

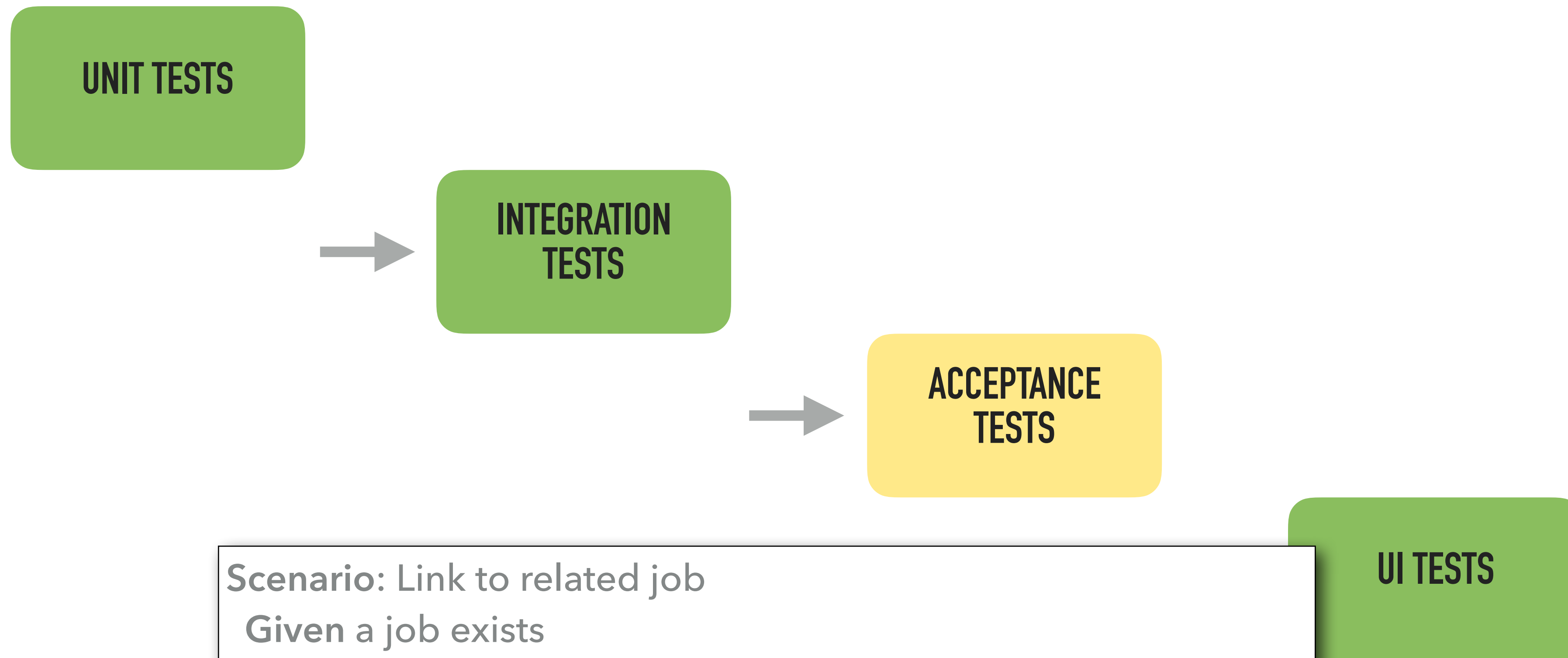
UI TESTS

# DEFENSE IN DEPTH



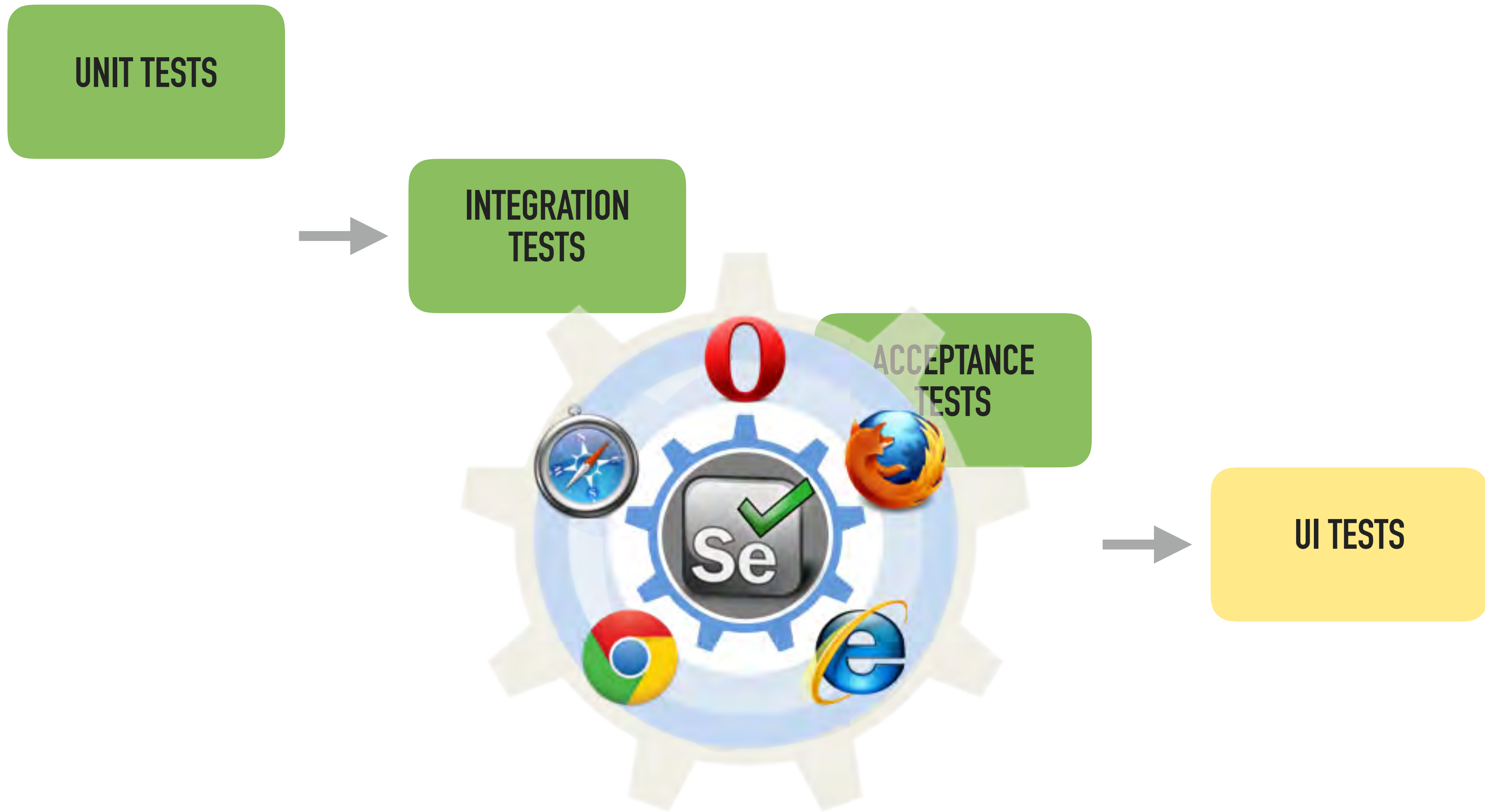


# DEFENSE IN DEPTH

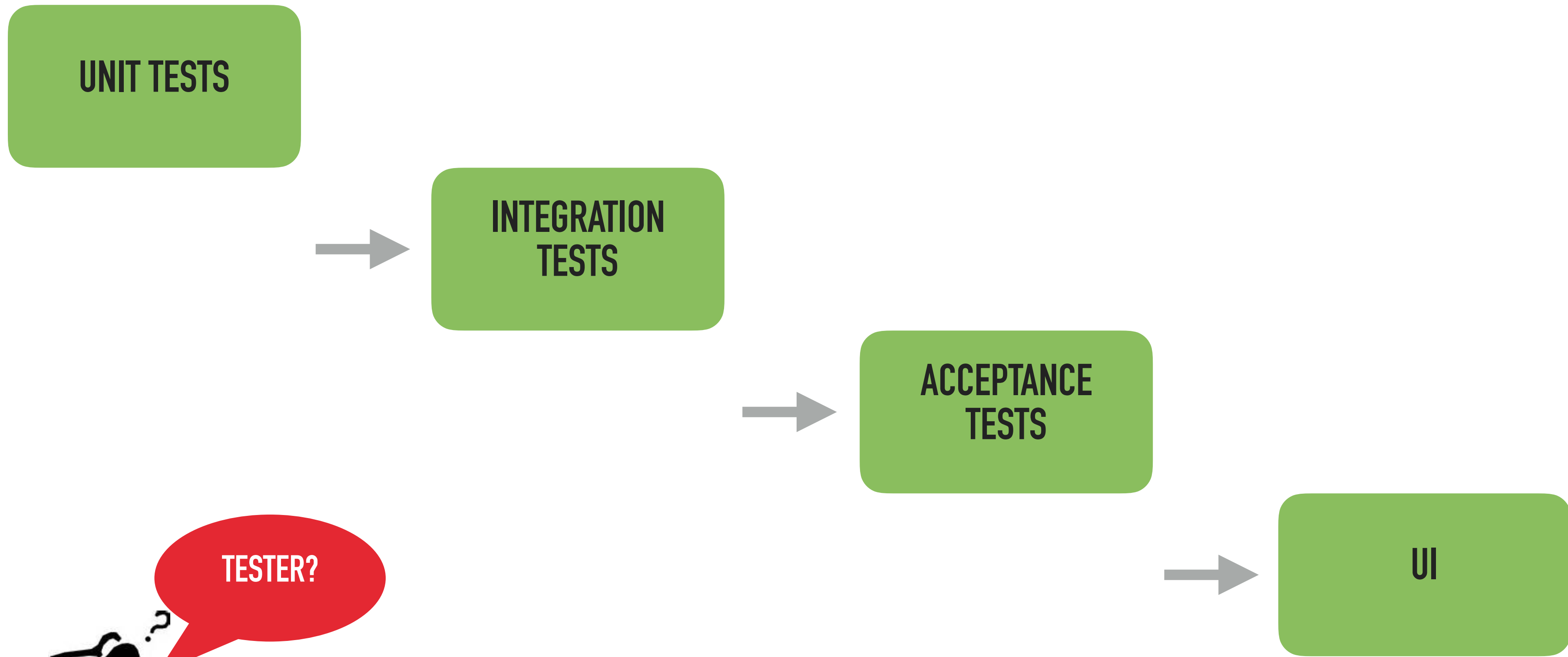


Scenario: Link to related job  
Given a job exists  
And there are related jobs available  
When that job is viewed  
Then a list of related jobs is shown  
And each related job links to the detail page of the related job

# DEFENSE IN DEPTH



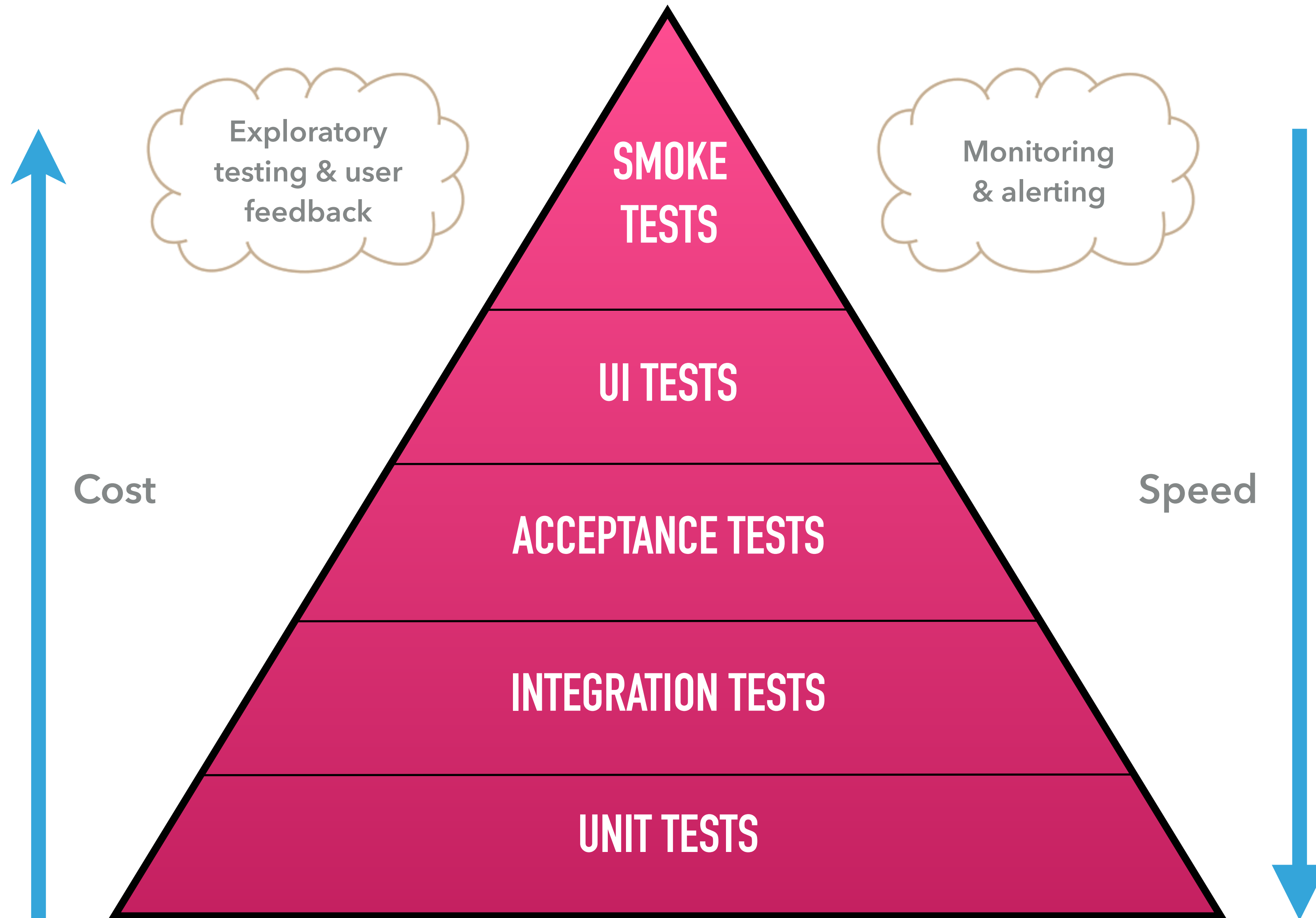
# DEFENSE IN DEPTH





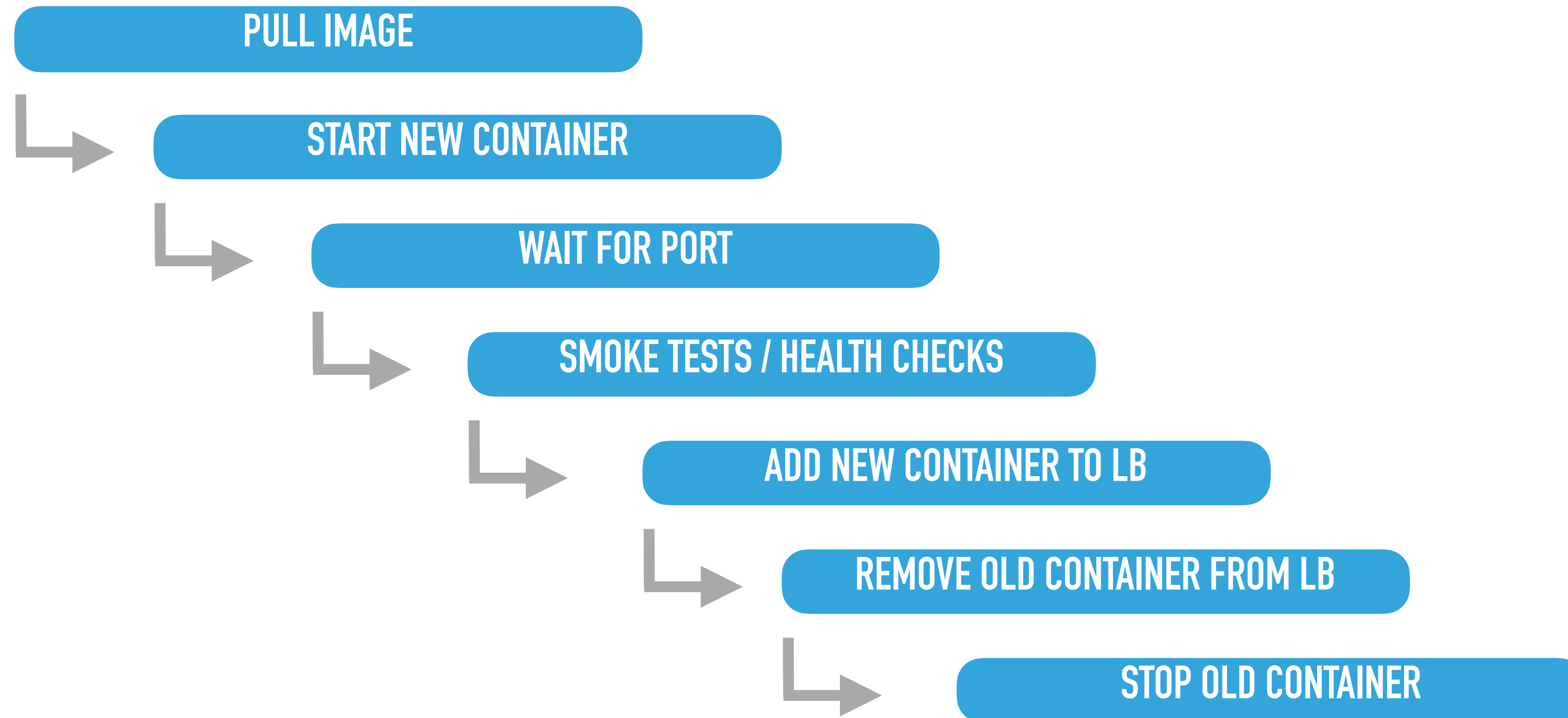




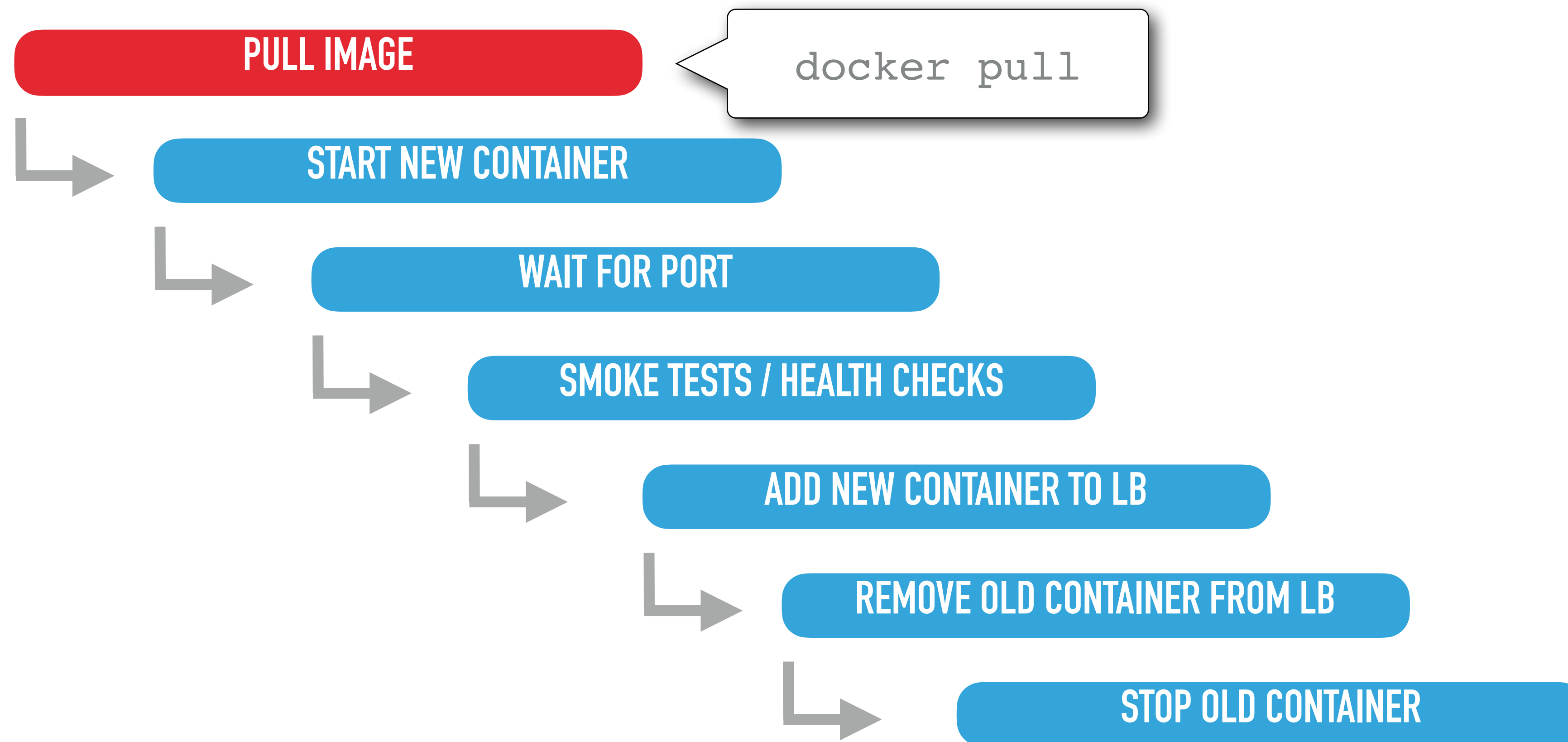


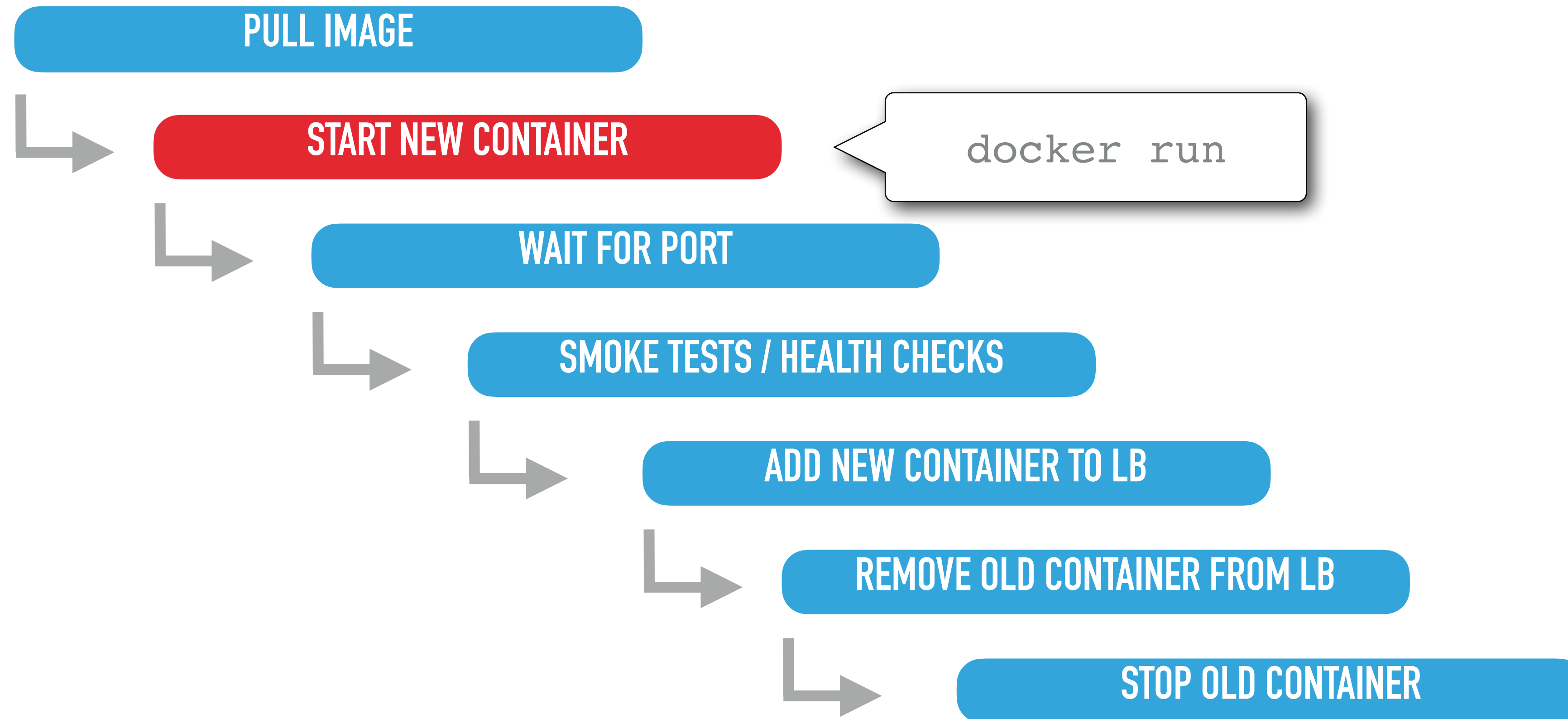
**GOOD ENOUGH**

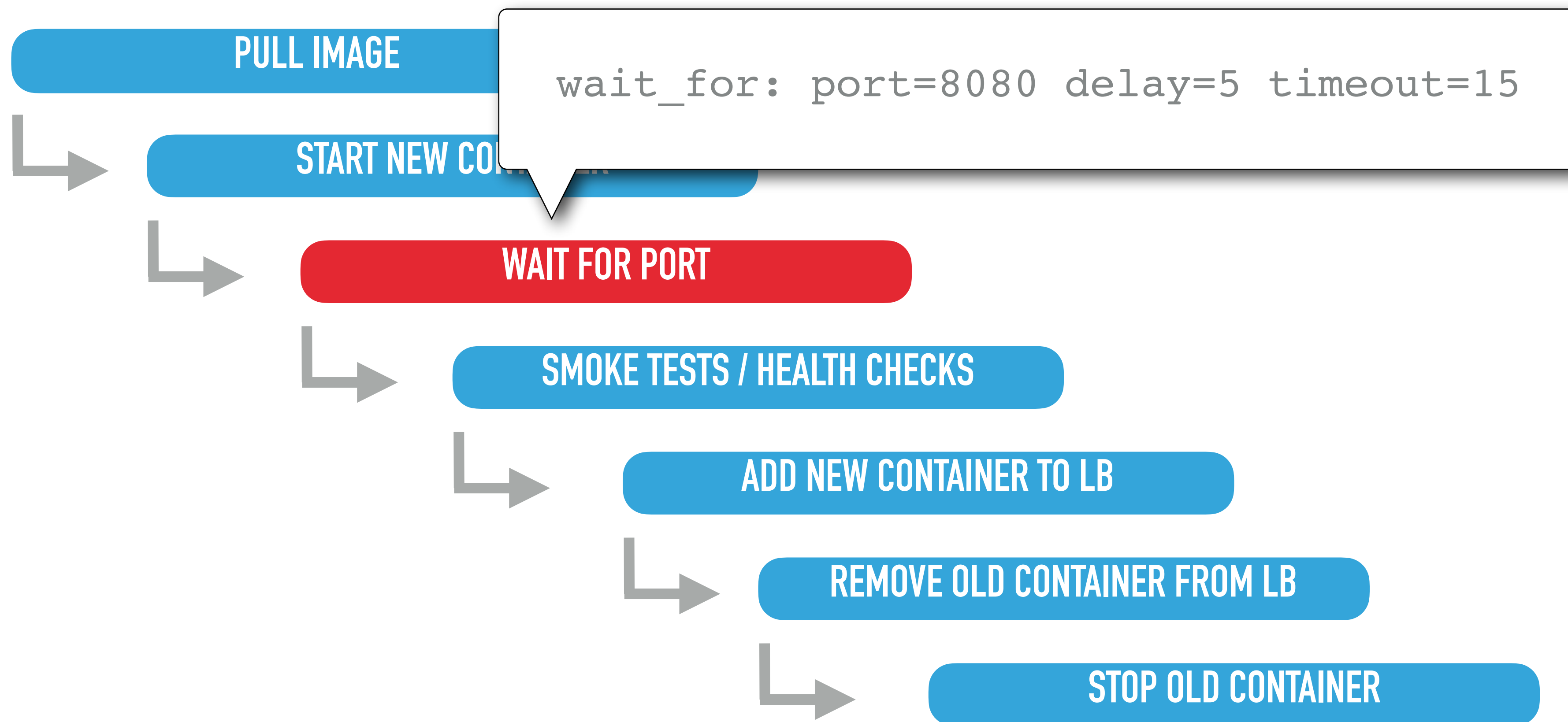
**PIPELINE SPEED = KEY**

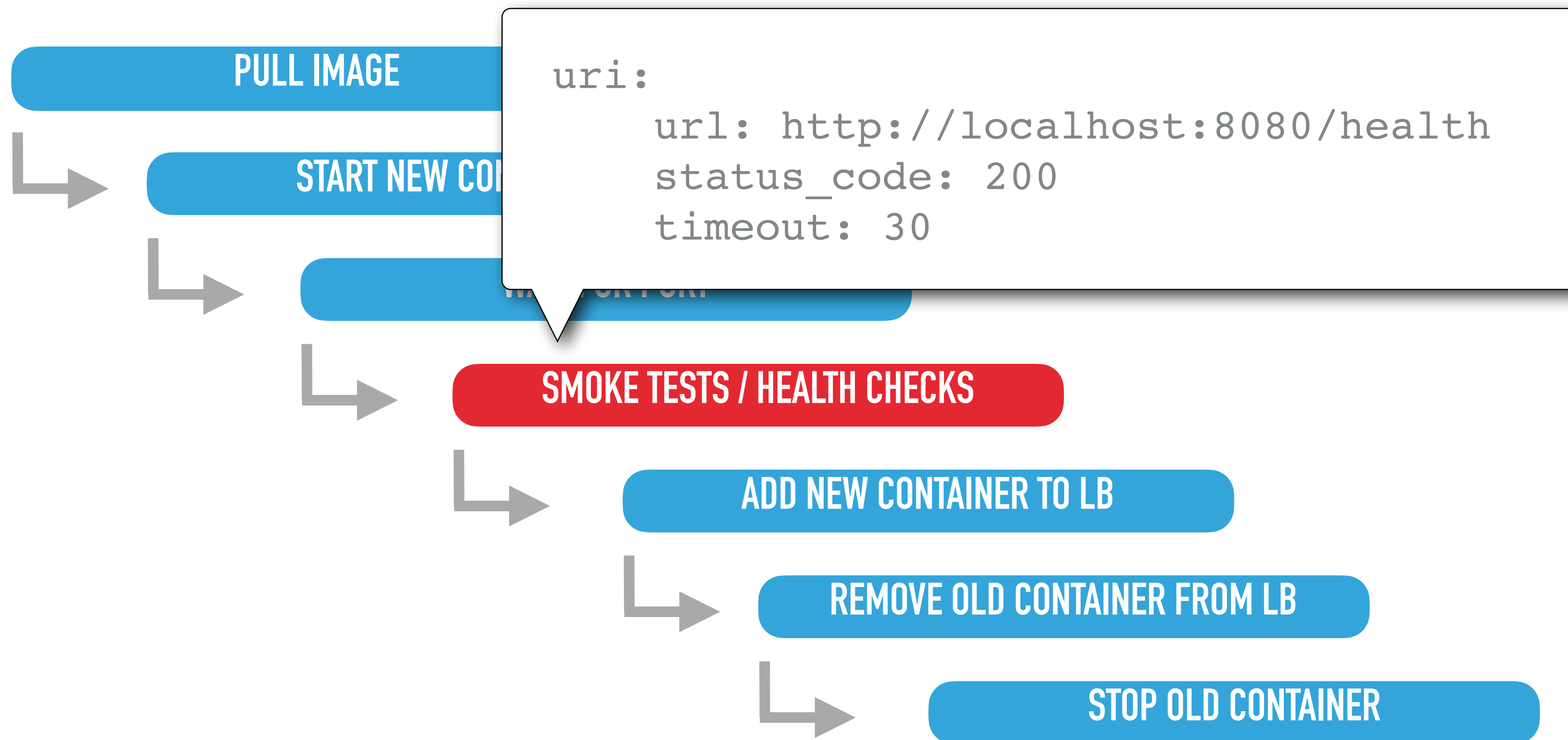














## PULL IMAGE

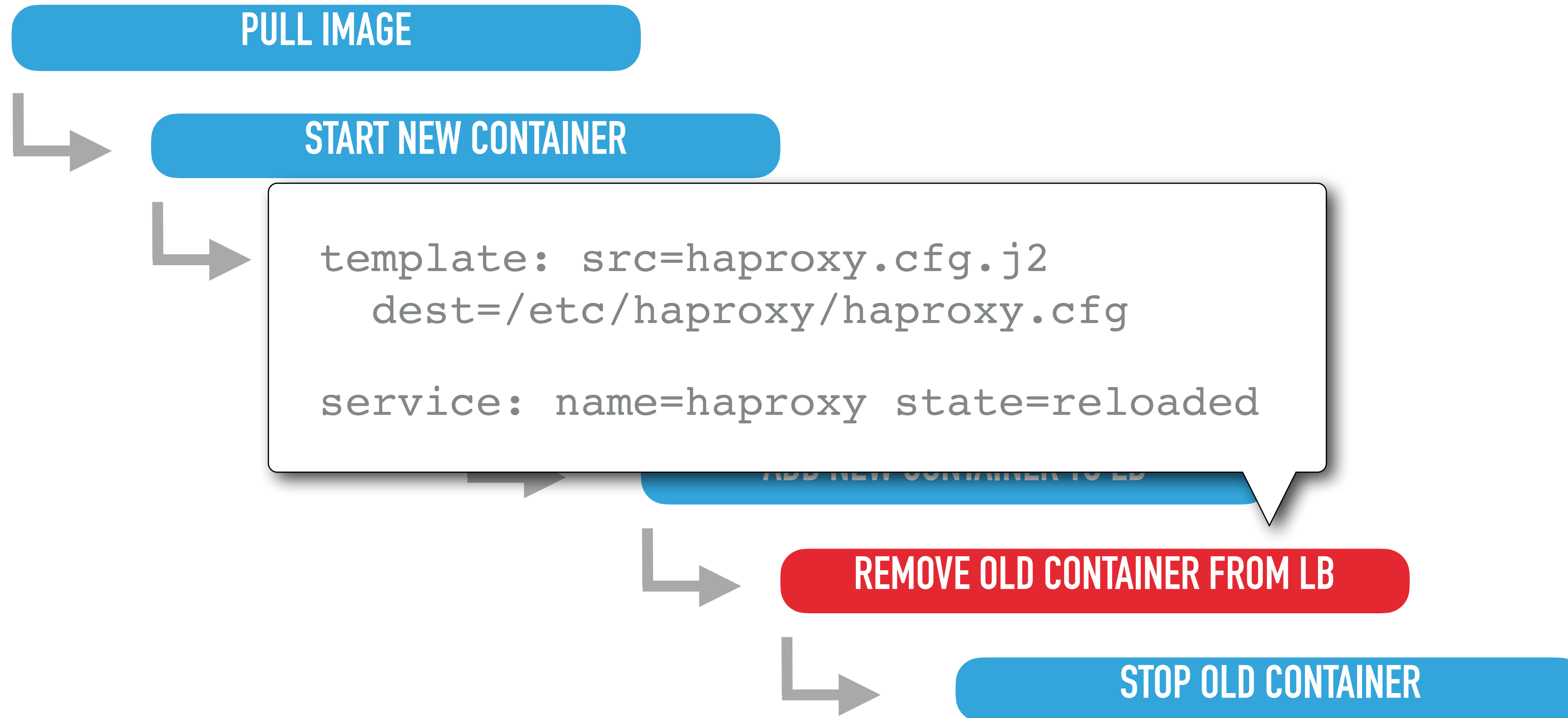
```
template: src=haproxy.cfg.j2
          dest=/etc/haproxy/haproxy.cfg

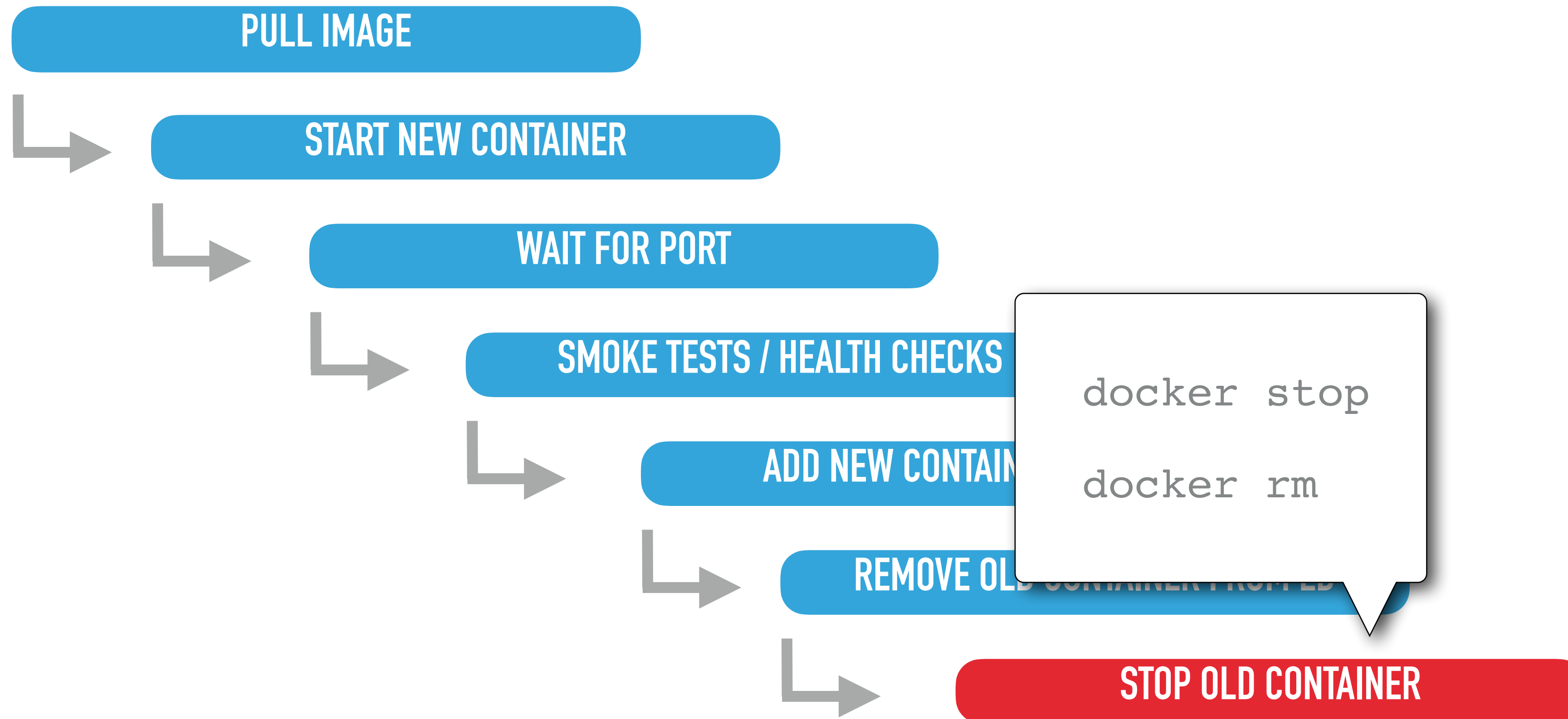
service: name=haproxy state=reloaded
```

ADD NEW CONTAINER TO LB

REMOVE OLD CONTAINER FROM LB

STOP OLD CONTAINER





# PIPELINE AS CODE

```
node {
  stage('Run tests') {
    sh "phpunit"
    sh "behat"
  }

  stage('Build docker image') {
    sh "docker build -t jobservice:${env.BUILD_NUMBER} ."
    sh "docker push jobservice:${env.BUILD_NUMBER}"
  }

  stage('Deploy staging') {
    sh "ansible-playbook -e BUILD=${env.BUILD_NUMBER}
      -i staging deploy.yml"
  }

  stage('Deploy production') {
    sh "ansible-playbook -e BUILD=${env.BUILD_NUMBER}
      -i prod deploy.yml"
  }
}
```





Average stage times:  
(Average full run time: ~3min  
31s)

#9	Jun 10 10:41	No Changes
#8	Jun 10 10:32	No Changes

	Run tests	Build docker image	Deploy acceptance	Deploy production
	39s	41s	53s	1min 17s
#9	46s	51s	1min 12s	2min 9s
#8	32s	31s	35s	26s





**FEEDBACK!**





# RESULTS



Team acceptance



Team acceptance

Feature toggle cap

Team acceptance

Feature toggle cap

Business alignment & agility

Team acceptance

Feature toggle cap

Business alignment & agility

Focus on replacing legacy

1

Reduced  
number of  
issues



1

Reduced  
number of  
issues

2

Build time  
< 10 min.  
(50+ per  
day)

1

Reduced  
number of  
issues

2

Build time  
< 10 min.  
(50+ per  
day)

3

Improved  
metrics &  
audience  
statistics

1

Reduced  
number of  
issues

2

Build time  
< 10 min.  
(50+ per  
day)

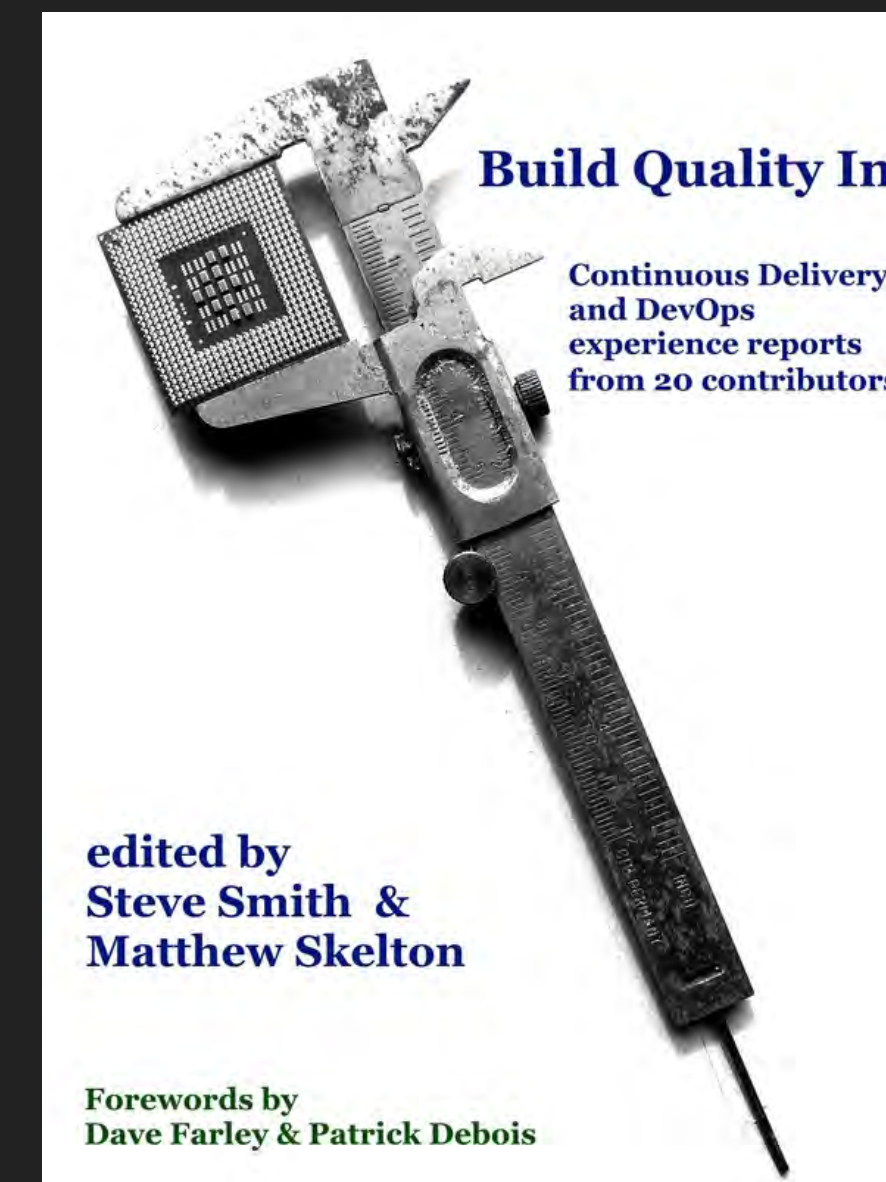
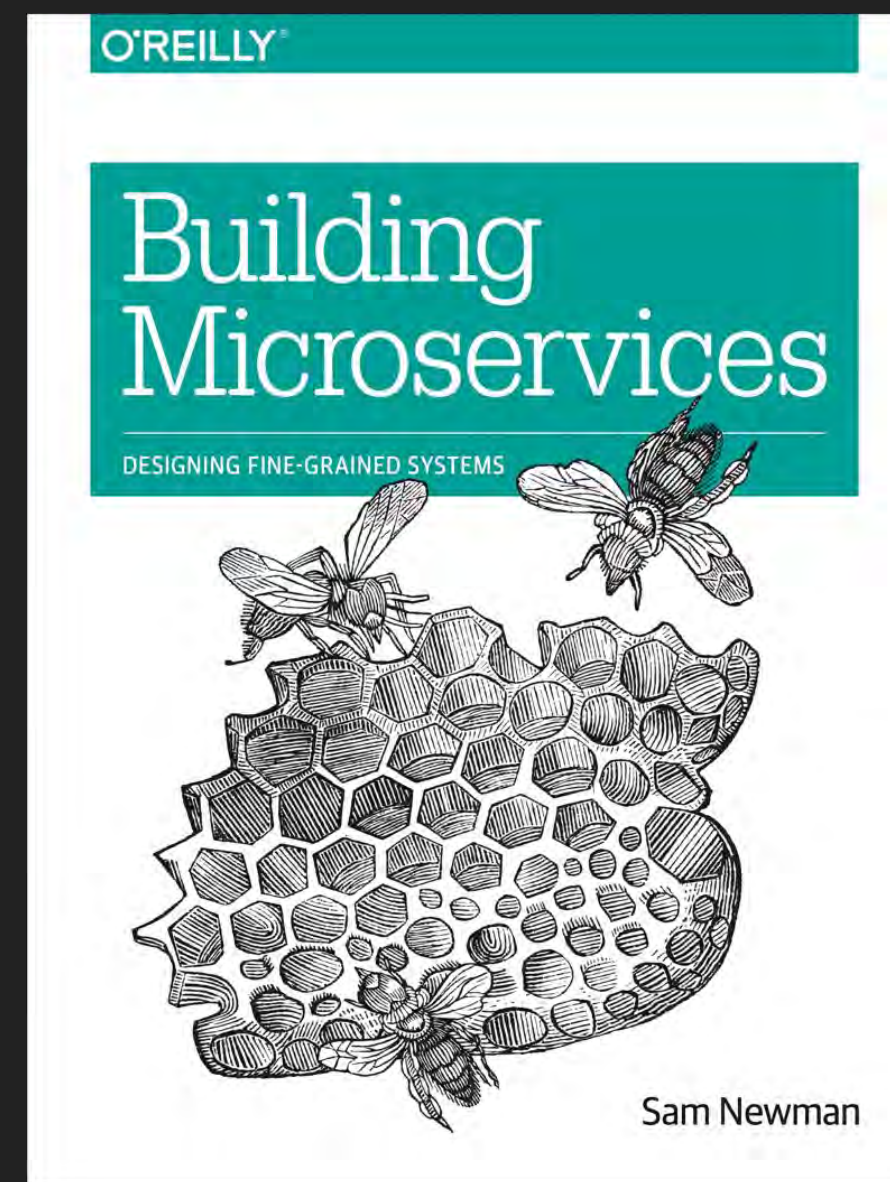
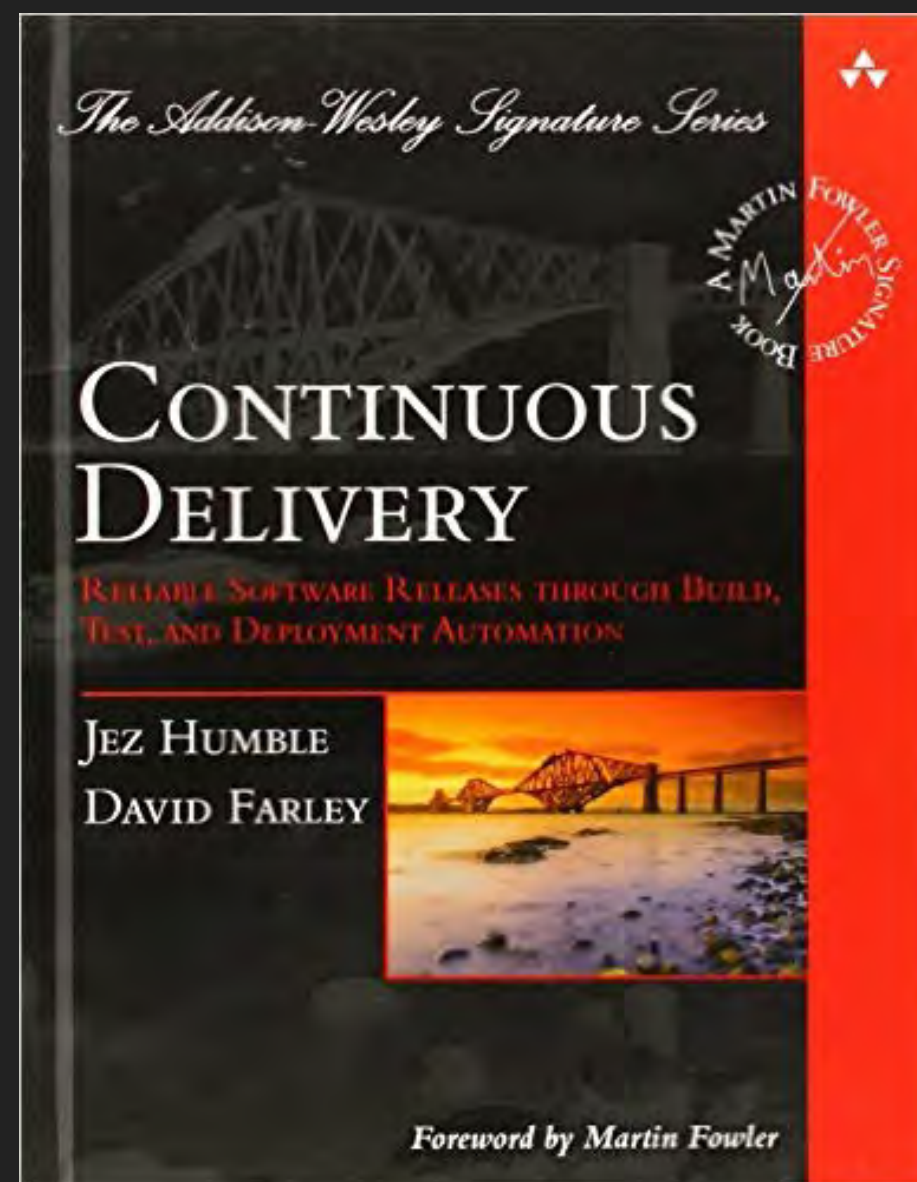
3

Improved  
metrics &  
audience  
statistics

4

Increased  
confidence,  
velocity &  
fun

# LITERATURE



<https://trunkbaseddevelopment.com/>





Reduce cycle times. React faster to the market and test product ideas. Make things!



We make Agile,  
DevOps and  
Continuous Delivery  
accessible!



Hands-on, results-  
oriented approach to  
get you where you  
need to be.



Modern  
infrastructure and  
pipelines in minutes.

# THANK YOU!

@michieltcs / mrook@fourscouts.nl

[www.michielrook.nl](http://www.michielrook.nl)

