Deployment Pipelines
for Java Apps
using **OpenShift**

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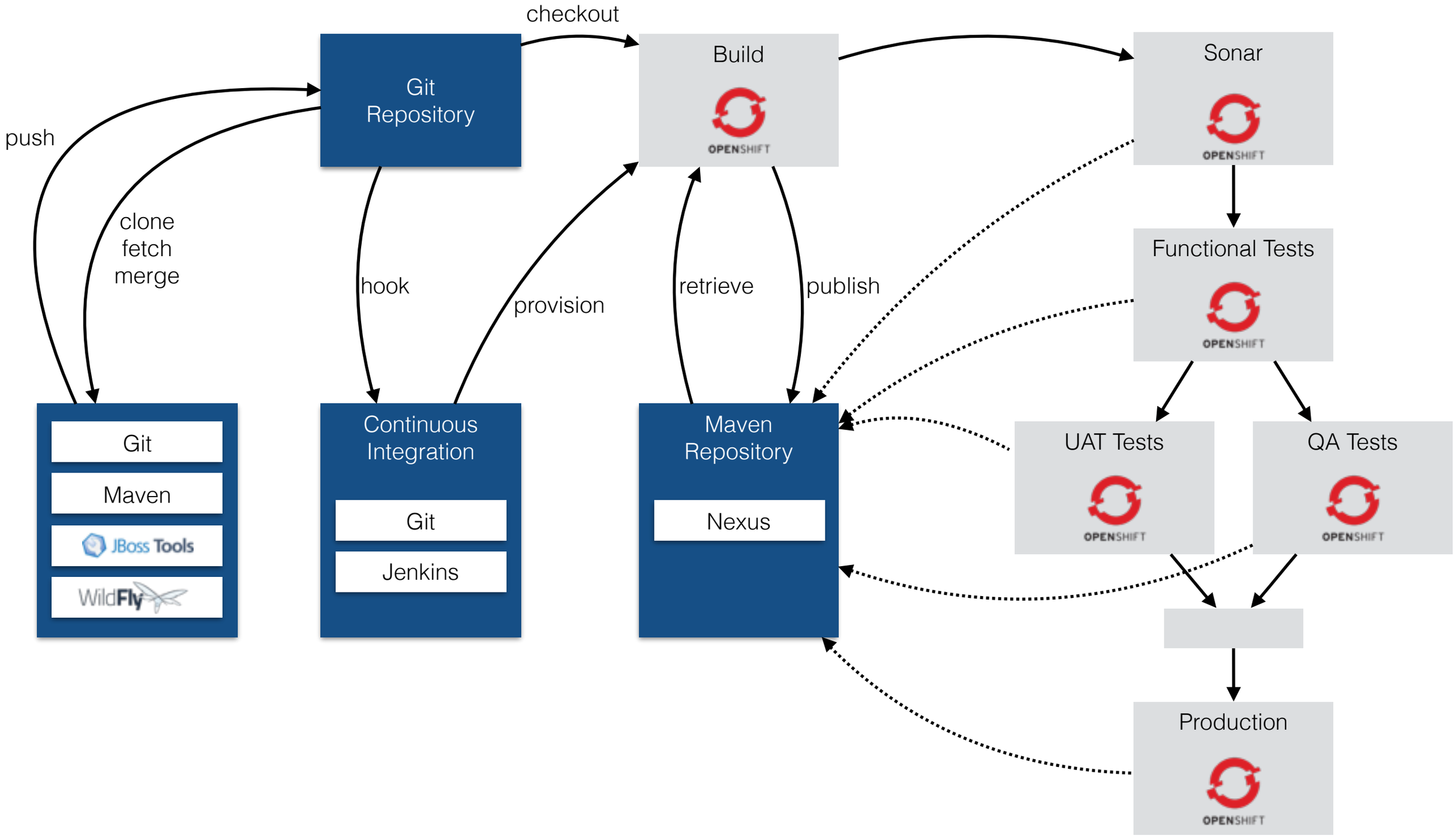
Deployment Pipeline with PaaS




WORKED FINE IN DEV
OPS PROBLEM NOW
memegenerator.net

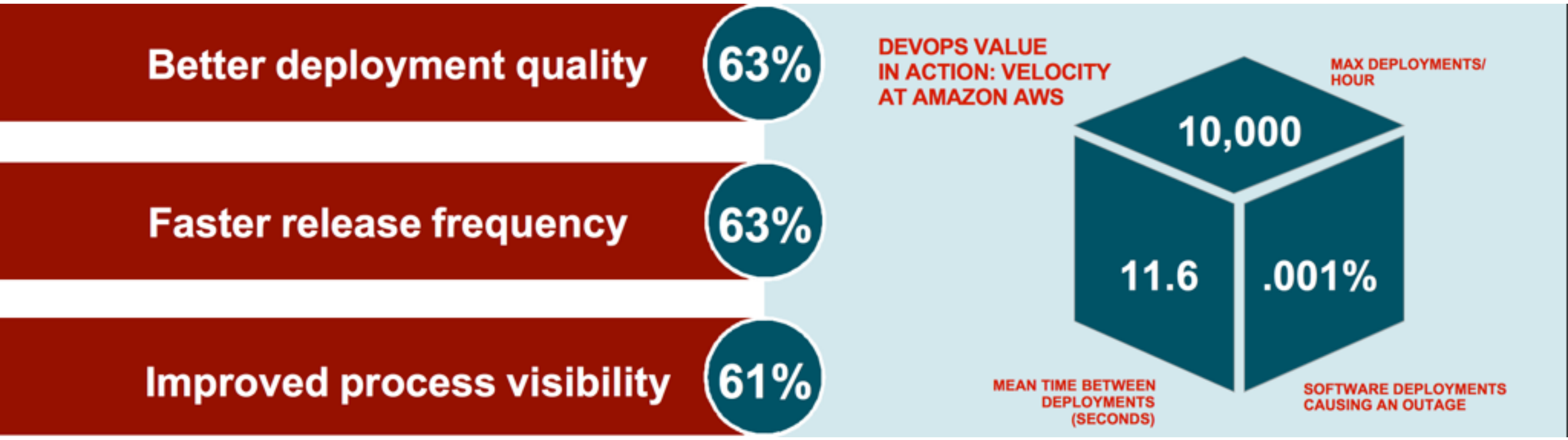
Is DevOps for you?

Ship code 30x faster
and complete those deployments 8,000 times faster than their peers.

Have 50% fewer failures
and restore service 12 times faster than their peers.

https://puppetlabs.com/wp-content/uploads/2013/03/2013-state-of-devops-report.pdf

Organizations implementing DevOps



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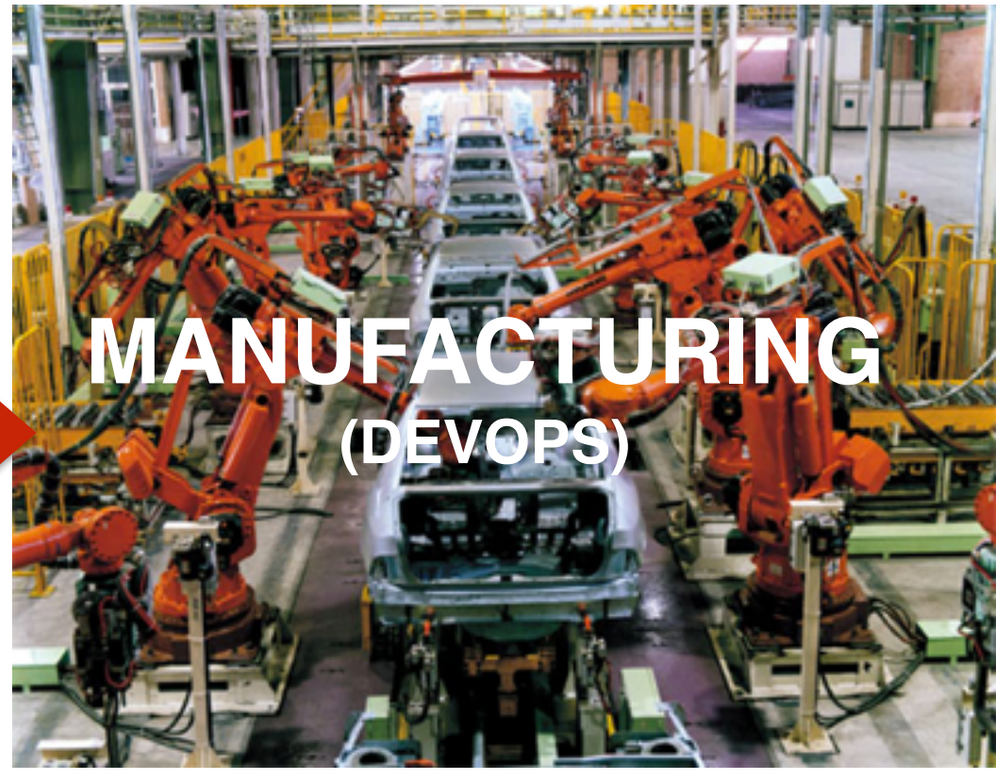
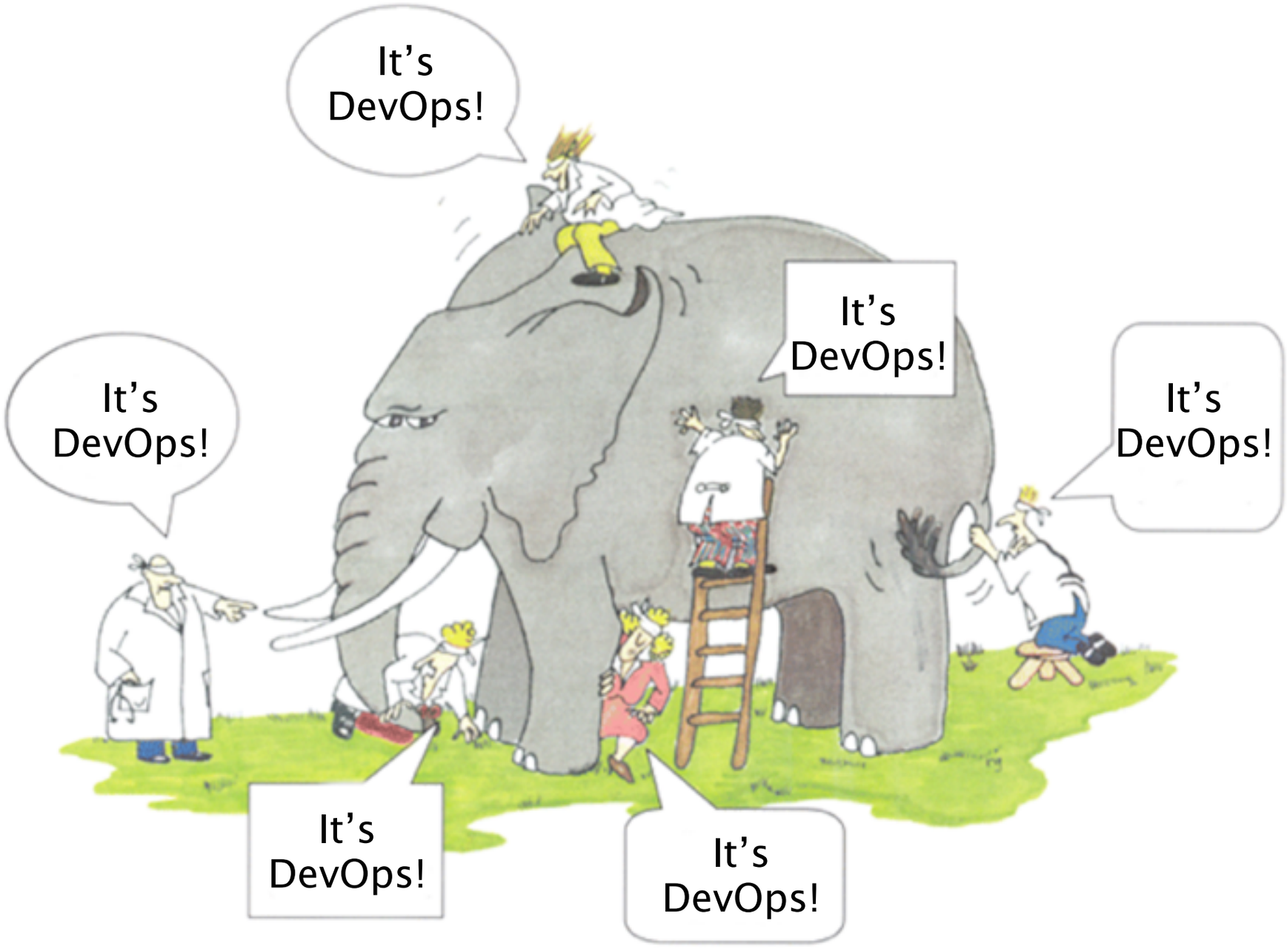
CRAFTWORK


MANUFACTURING
(DEVOPS)


WORKSHOP


FACTORY
(CLOUD)

What is DevOps?



DevOps is...

* A philosophy that starts with passion
* A cultural, professional movement with attitude and values
* A reaction to poor communication
* About creating visibility between dev and ops
* About the symbiotic relationship between dev and ops
* Cross-functional teams over organizational silos
* Products not projects
* Automation over documentation (and more automation... and more...)
* About creating self-service infrastructure for teams
* Knowing that good software doesn't end with development / release
* Software that doesn't require support
* Ensuring a continual feedback loop between development and operations
* Cross-functional teams over organizational silos
* Creating products that are owned by the delivery team
* Knowing that a project is only finished when it is retired from production
* Something you can do without doing agile

https://sites.google.com/a/jezhumble.net/devops-manifesto/

Key Components of DevOps

- **People**: “Dev” and “Ops”
- **Processes**: Continuous Delivery, Agile, …
- **Tools**: Jenkins, Chef, Sonar, Arquillian, PaaS, …

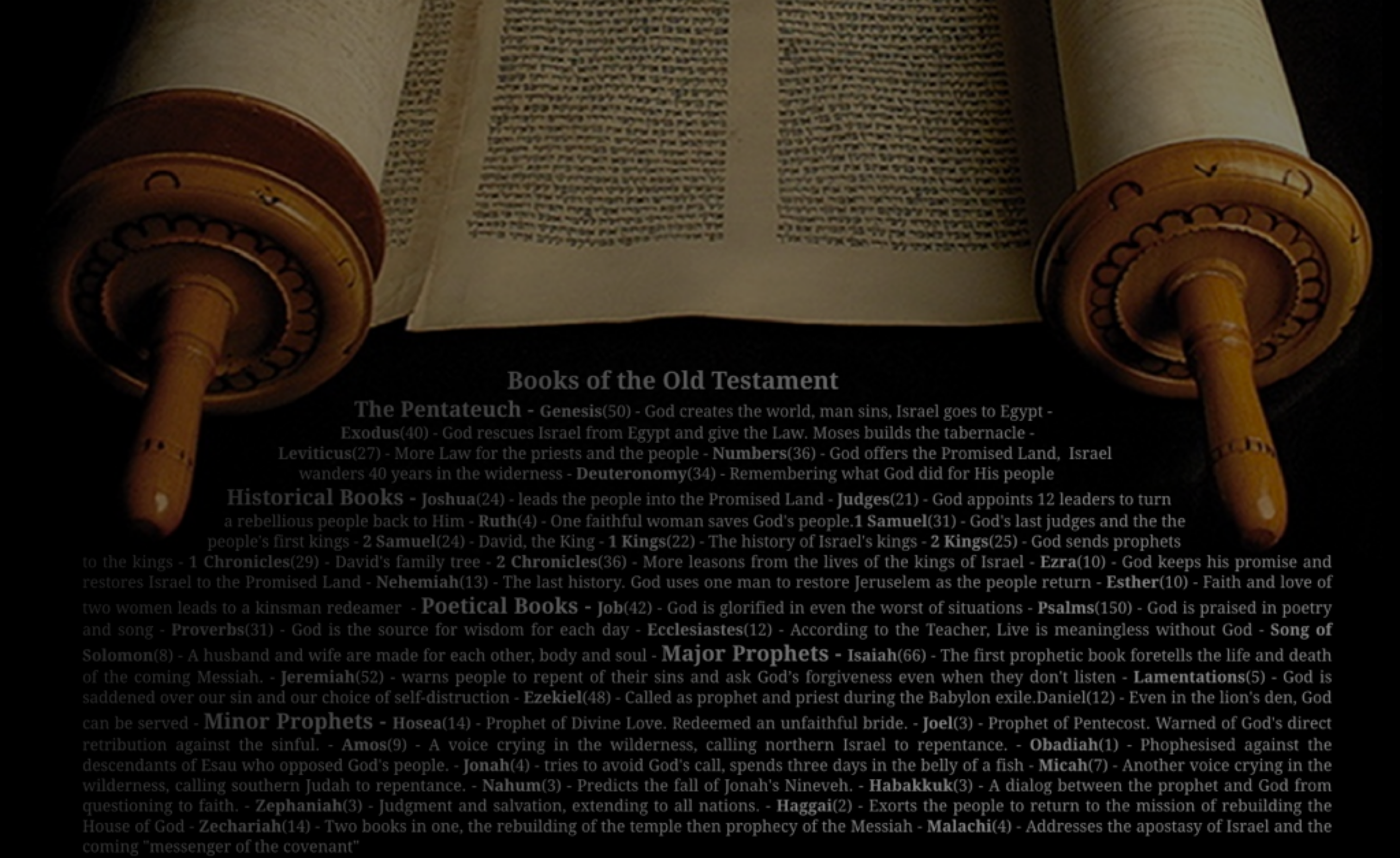
Five “C”s of DevOps

- **C**ollaboration between “dev” and “ops”
- **C**ulture
- **C**ode everything - application and configuration
- **C**onsistency - automation over documentation
- **C**ontinuous delivery

Collaboration

- "Dev"
  - Engineering
  - Test
  - Product management

- "Ops"
  - System administrators
  - Operations staff
  - DBAs
  - Network engineers
  - Security professionals



“Devs” job is to add new features
“Ops” job is to keep the site stable and fast

“Ops” job is NOT to keep the site stable and fast

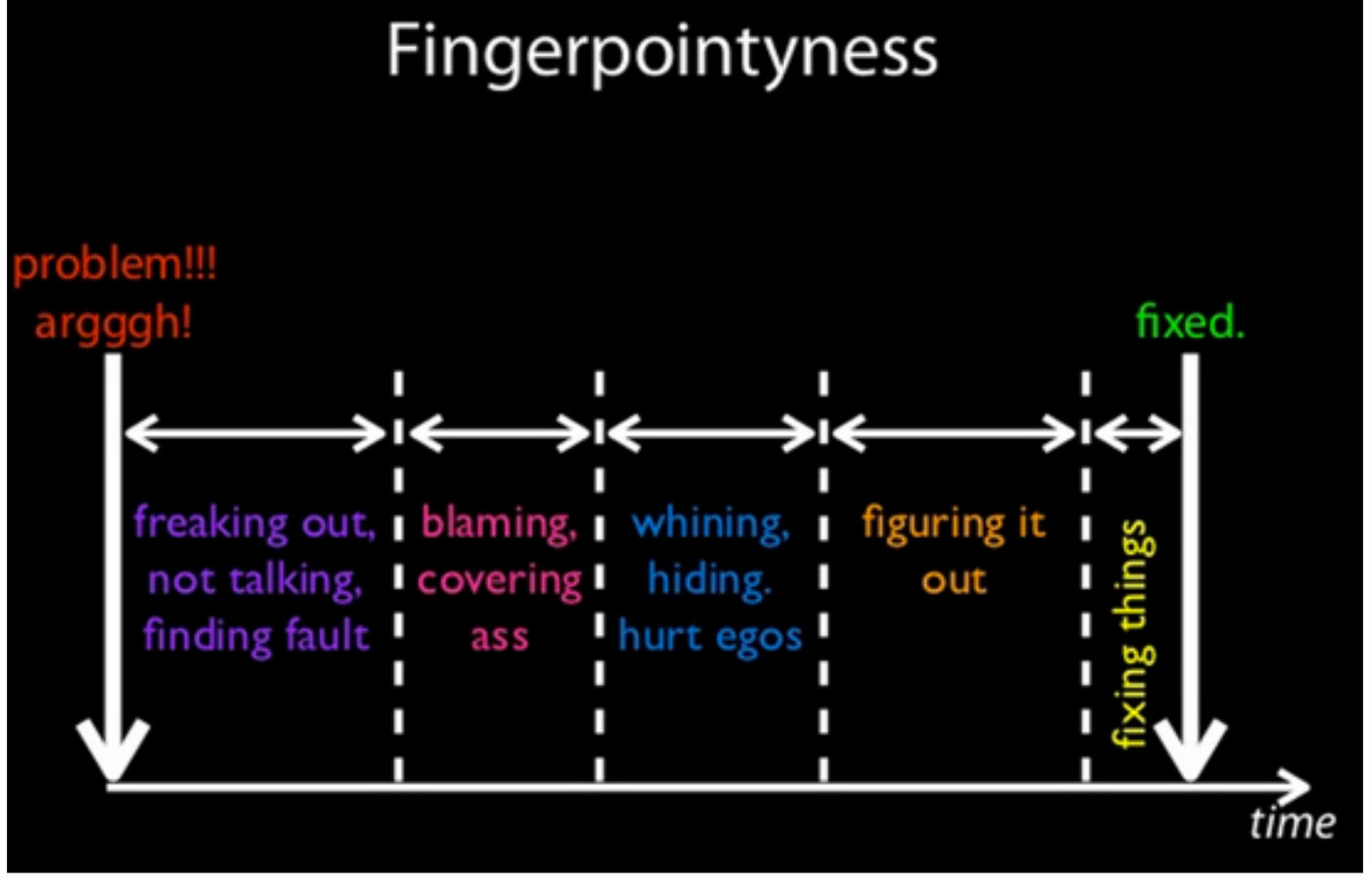
“Ops” job is to enable business

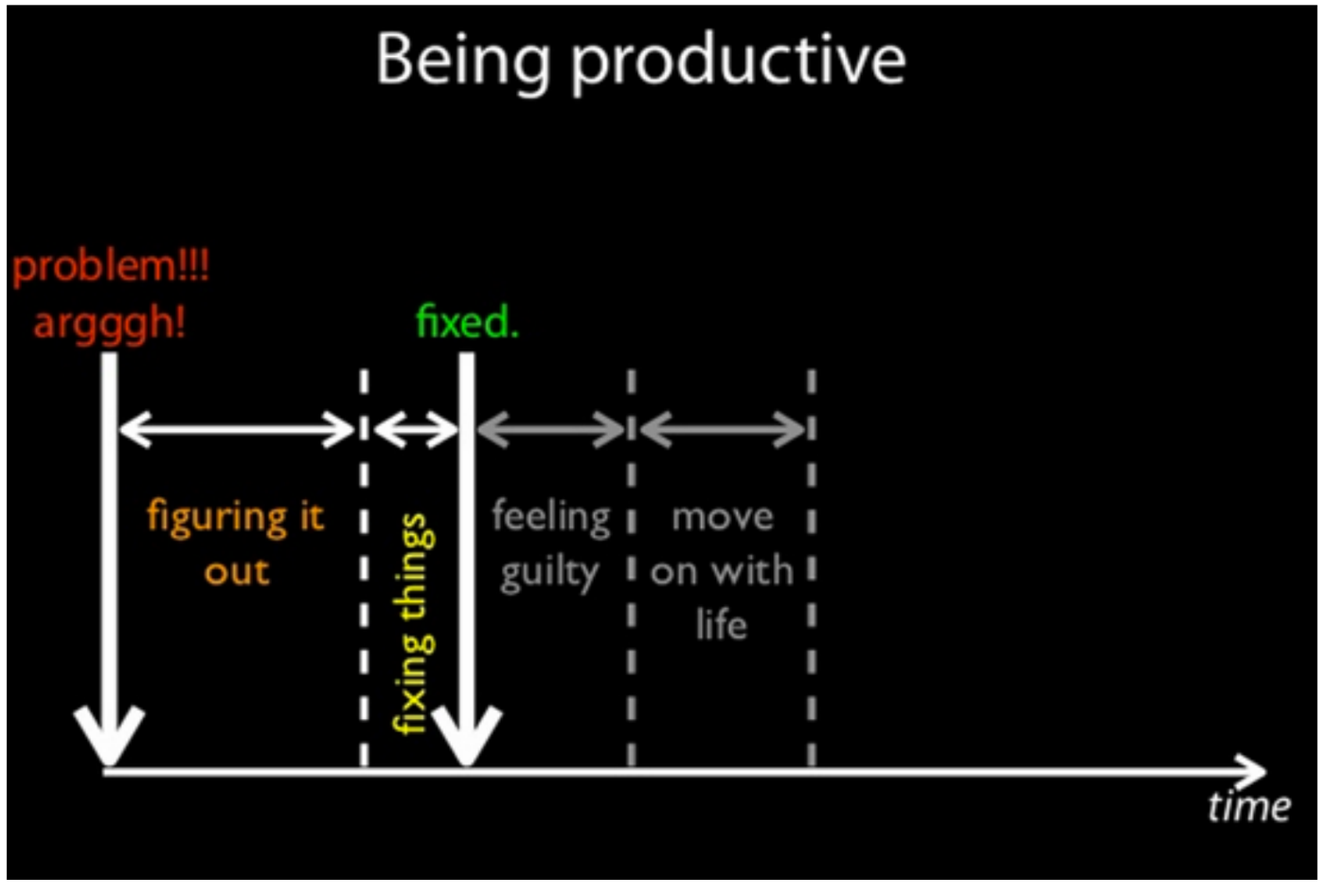
And so is “devs”


“Dev” “Ops”

Culture

- Respect other's expertise, opinions, responsibilities
- Trust: Ops to think like devs, vice versa
  - Leads to transparency
- Don't ignore failure, build joint recovery plans
- Amplify feedback loops





http://www.slideshare.net/jallspaw/10-deploys-per-day-dev-and-ops-cooperation-at-flickr

"Treat people warmly, issues coldly!"

With great power, comes great responsibility

“you build it, you run it!”

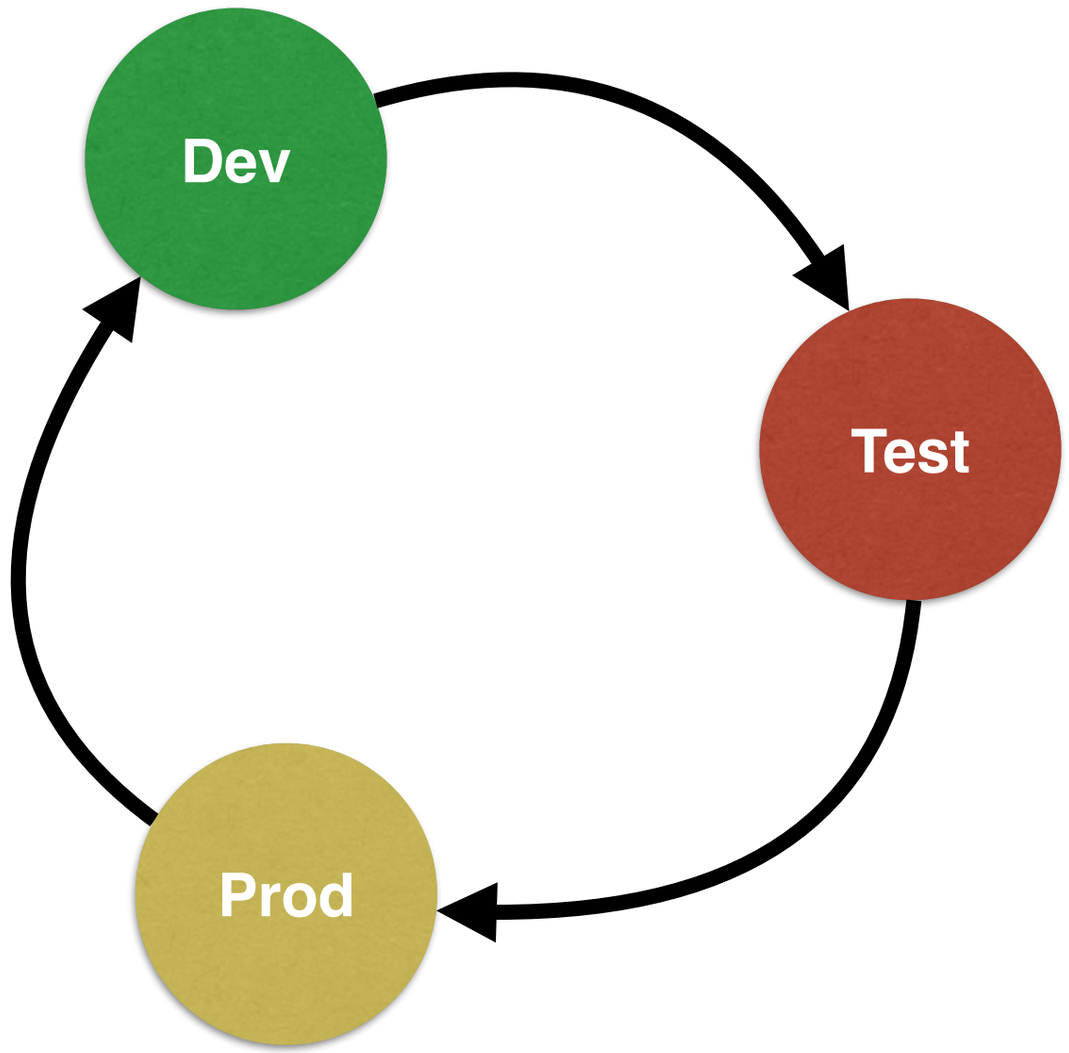
Code everything

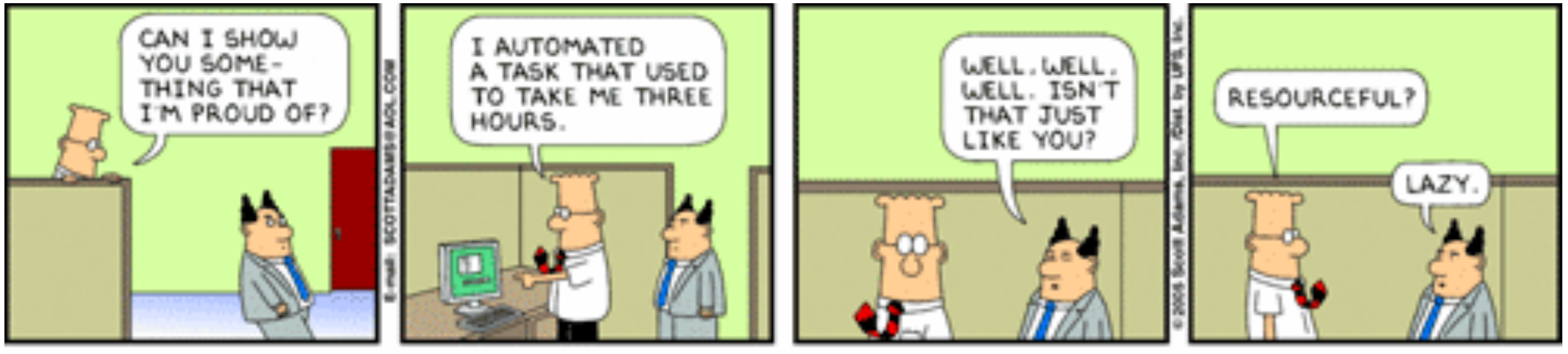
- Application code
- Build scripts
- Database schema
- Configuration files
- IDE configurations
- Infrastructure
- Deployment scripts
- Test code and scripts
- Provisioning scripts
- Monitoring
- Logging
- …

“Never send a human to do a machine’s job”

Consistency

- Automation over documentation
  - Repeatability
  - Push-button deployments
  - Managing environments

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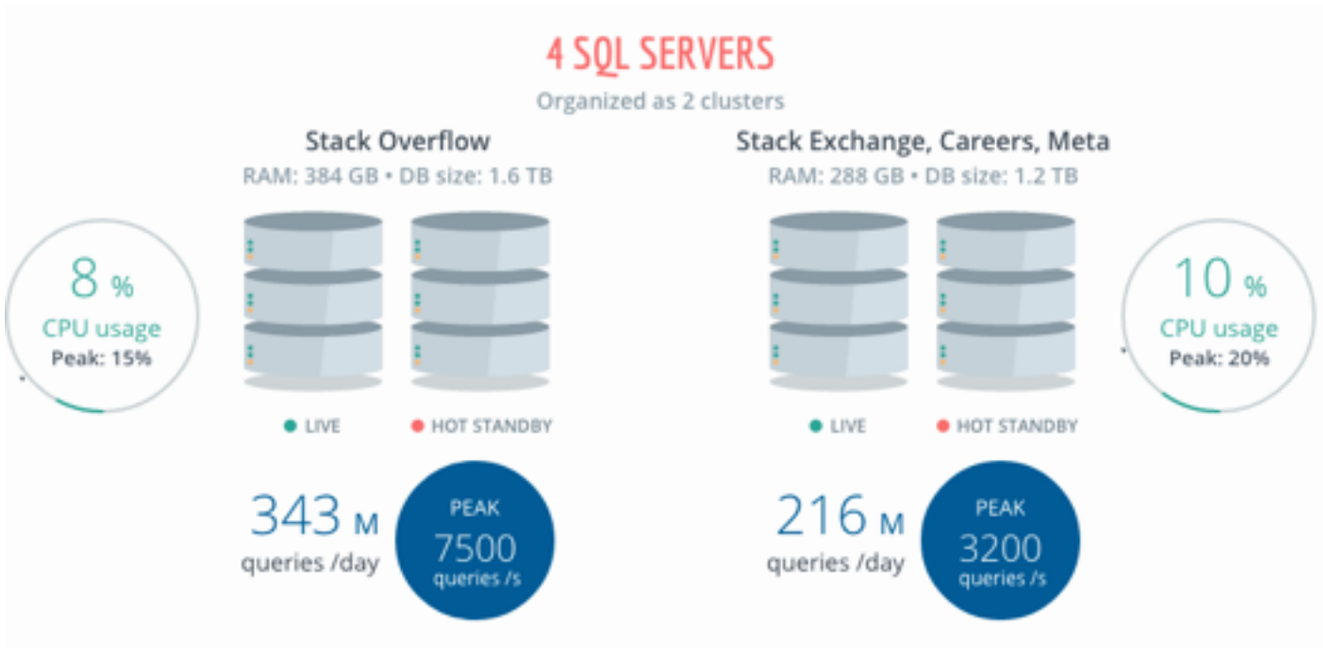
LAZY.
DID YOU JUST TURN MY BRILLIANT ACCOMPLISHMENT INTO A CHARACTER FLAW?
COMPLAINER.
LETS JUST FORGET THE WHOLE THING.
QUITTER.

Manage environments

- **Cloud computing**: PaaS, OpenShift, …
- **Virtualization**: Virtual Box, Vagrant, …
- **Containers**: Docker, Rocket, …
- **App server**: JBoss EAP, Tomcat, …
- **Configuration tools**: Puppet, Chef, Ansible, Salt
- **Orchestration**: Kubernetes, Swarm, …

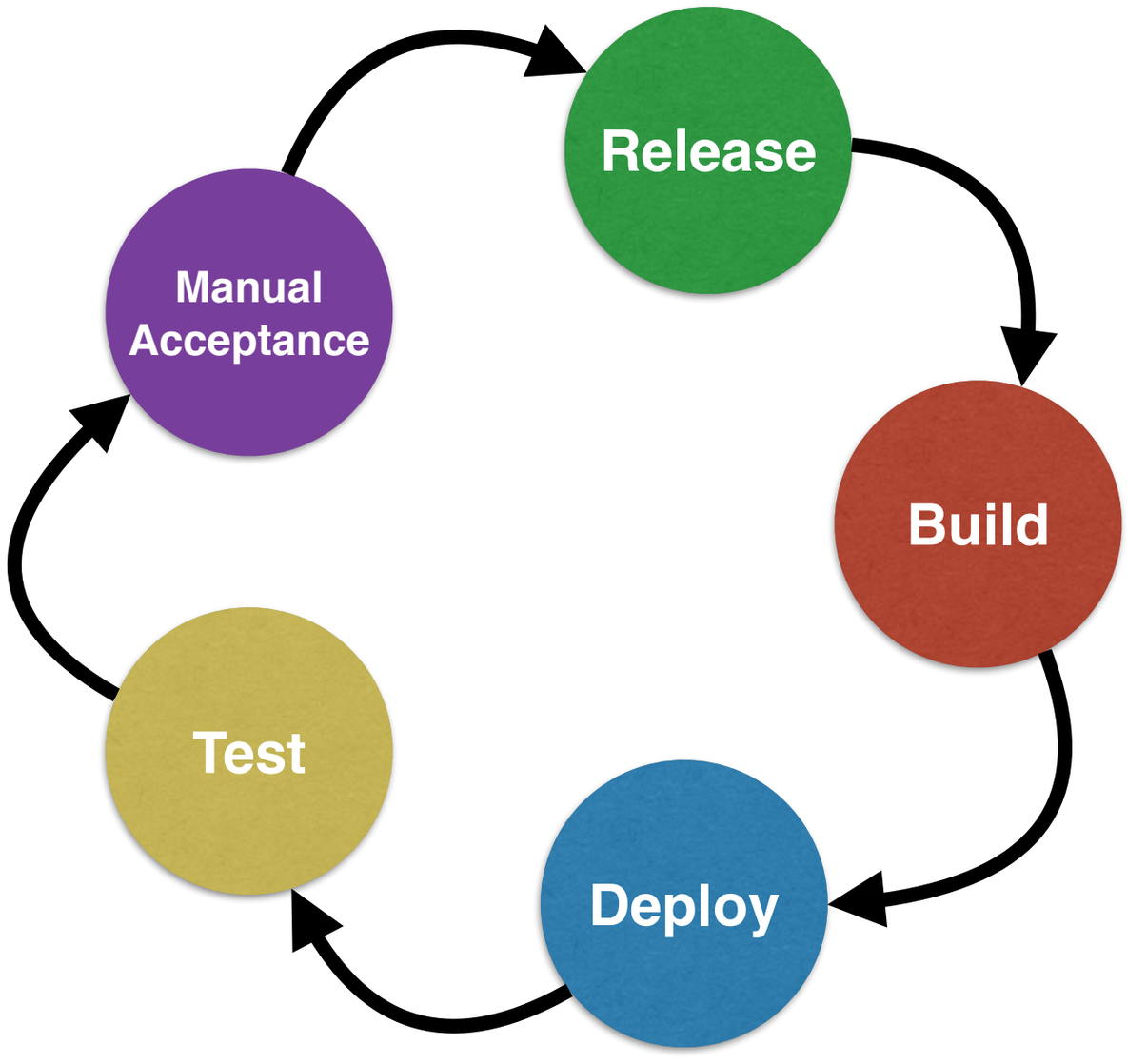
Dashboards

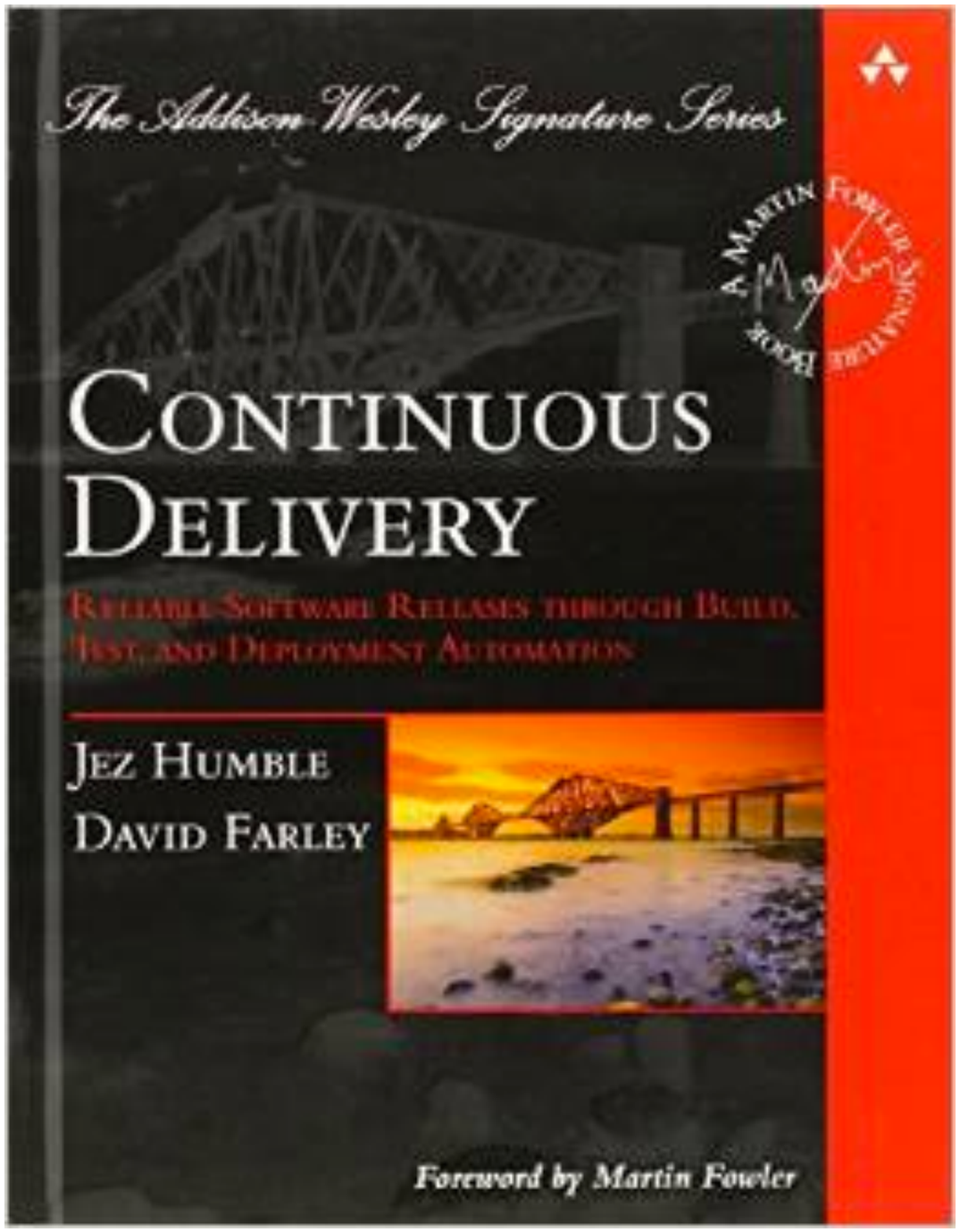
- Build dashboards, improve transparency
- stackexchange.com/performance



Continuous Delivery

- Continuous Integration
- Fail fast and recover
- Self service
- 100% Automation
- Push to Prod
- Proactive monitoring and metrics



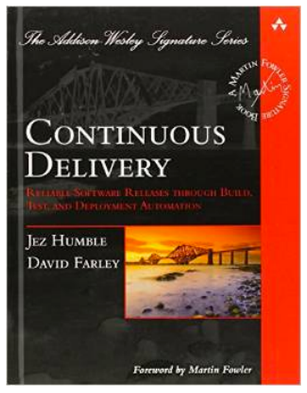


"it is the practice of releasing every good build to users"

"continuous integration to its logical conclusion"

Deployment Pipeline

“an automated implementation of your application’s build, deploy, test, and release process"



	Initial	Managed	Defined	Quantitatively Managed	Optimizing
Culture & Organization	• Teams organized based on platform/ technology • Defined and documented processes	• One backlog per team • Adopt agile methodologies • Remove team boundaries	• Extended team collaboration • Remove boundary dev/ ops • Common process for all changes	• Cross-team continuous improvement • Teams responsible all the way to production	• Cross functional teams
Build & Deploy	• Centralized version control • Automated build scripts • No management of artifacts • Manual deployment • Environments are manually provisioned	• Polling CI builds • Any build can be re-created from source control • Management of build artifacts • Automated deployment scripts • Automated provisioning of environments	• Commit hook CI builds • Build fails if quality is not met (code analysis, performance, etc.) • Push button deployment and release of any releasable artifact to any environment • Standard deployment process for all environments	• Team priorities keeping codebase deployable over doing new work • Builds are not left broken • Orchestrated deployments • Blue Green Deployments	• Zero touch Continuous Deployments
Release	• Infrequent and unreliable releases • Manual process	• Painful infrequent but reliable releases	• Infrequent but fully automated and reliable releases in any environment	• Frequent fully automated releases • Deployment disconnected from release • Canary releases	• No rollbacks, always roll forward
Data Management	• Data migrations are performed manually, no scripts	• Data migrations using versioned scripts, performed manually	• Automated and versioned changes to datastores	• Changes to datastores automatically performed as part of the deployment process	• Automatic datastore changes and rollbacks tested with every deployment
Test & Verification	• Automated unit tests • Separate test environment	• Automatic Integration Tests • Static code analysis • Test coverage analysis	• Automatic functional tests • Manual performance/ security tests	• Fully automatic acceptance tests • Automatic performance/security tests • Manual exploratory testing based on risk based testing analysis	• Verify expected business value • Defects found and fixed immediately (roll forward)
Information & Reporting	• Baseline process metrics • Manual reporting • Visible to report runner	• Measure the process • Automatic reporting • Visible to team	• Automatic generation of release notes • Pipeline traceability • Reporting history • Visible to cross-silo	• Report trend analysis • Real time graphs on deployment pipeline metrics	• Dynamic self-service of information • Customizable dashboards • Cross-reference across organizational boundaries

http://blog.arungupta.me/continuous-integration-delivery-deployment-maturity-model/

Tools

- **CI**: Jenkins, Travis CI, Bambo, …
- **Versioning**: Git, SVN, Mercurial, …
- **Monitoring**: Nagios, NewRelic, Pingdom, …
- **Logging**: Log stash, …

- 1000 releases/day
- No Chef/Puppet or QA/Release team
- 70% instances changed in 2 weeks, 90% every month
- Deployment **fully** automated

https://www.youtube.com/watch?v=WvpmiGURFYQ

Graphite · cacti · New Relic. · Chartbeat · Nagios

node · python · php · Java · ASGARD · amazon web services · ubuntu · puppet labs

Scott VanDenPlas
@scottvdp
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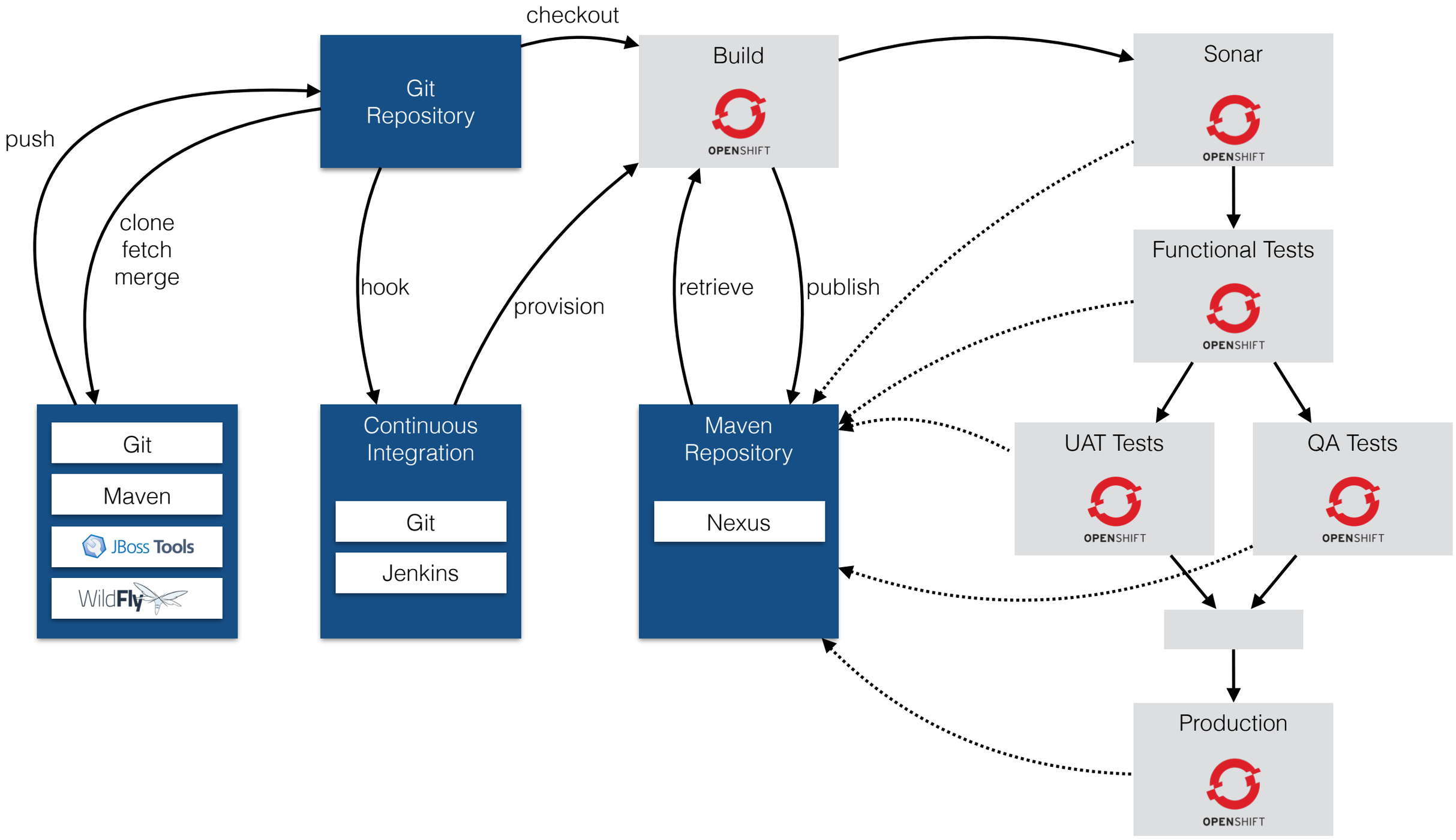
4Gb/s, 10k req/s, 2k nodes, 3 datacenters, 180TB and 8.5 billion req. Design, deploy, dismantle in 583 days to elect the President. #madops

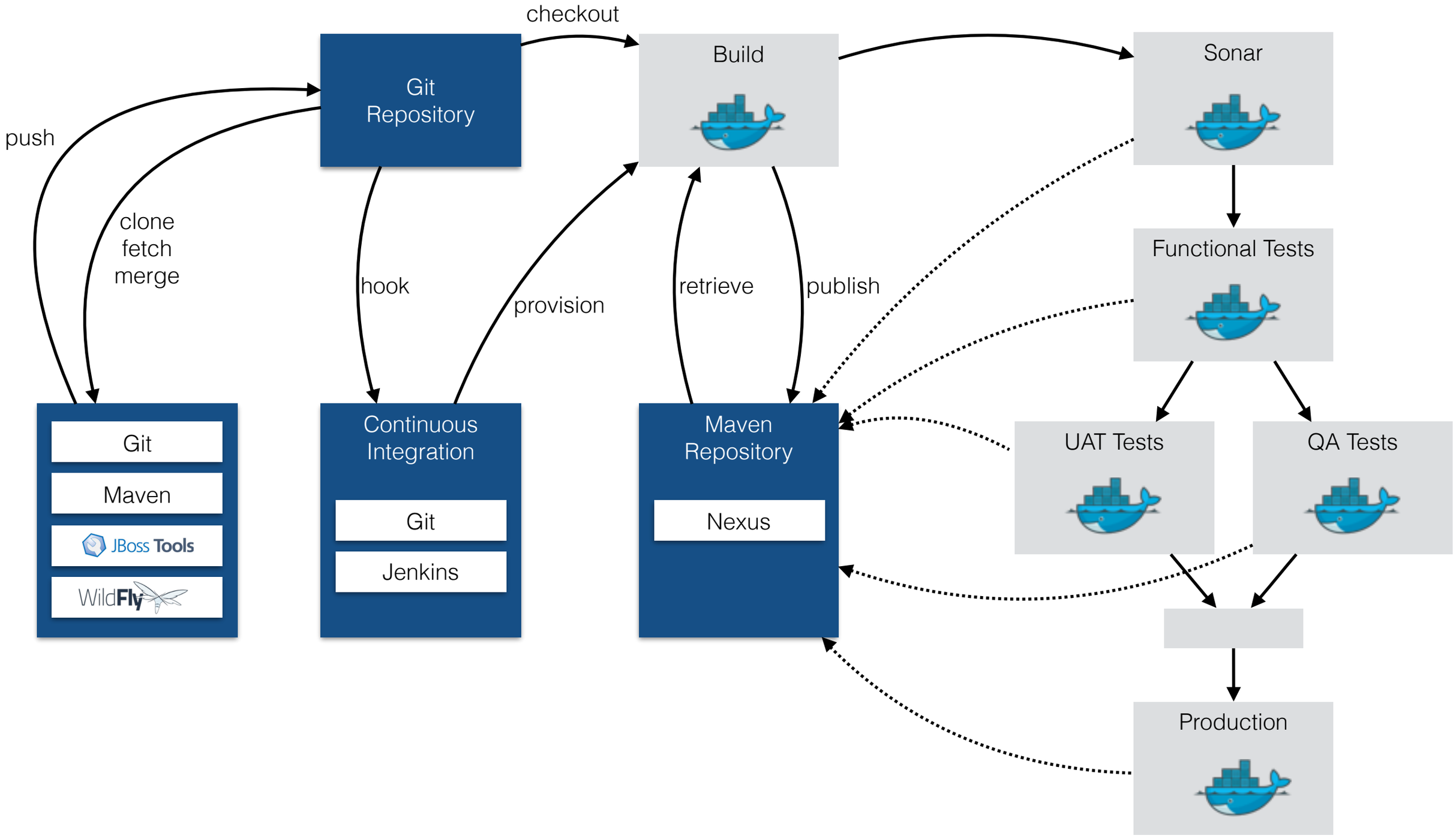
http://arstechnica.com/information-technology/2012/11/how-team-obamas-tech-efficiency-left-romney-it-in-dust/

Tools for DevOps with Java EE

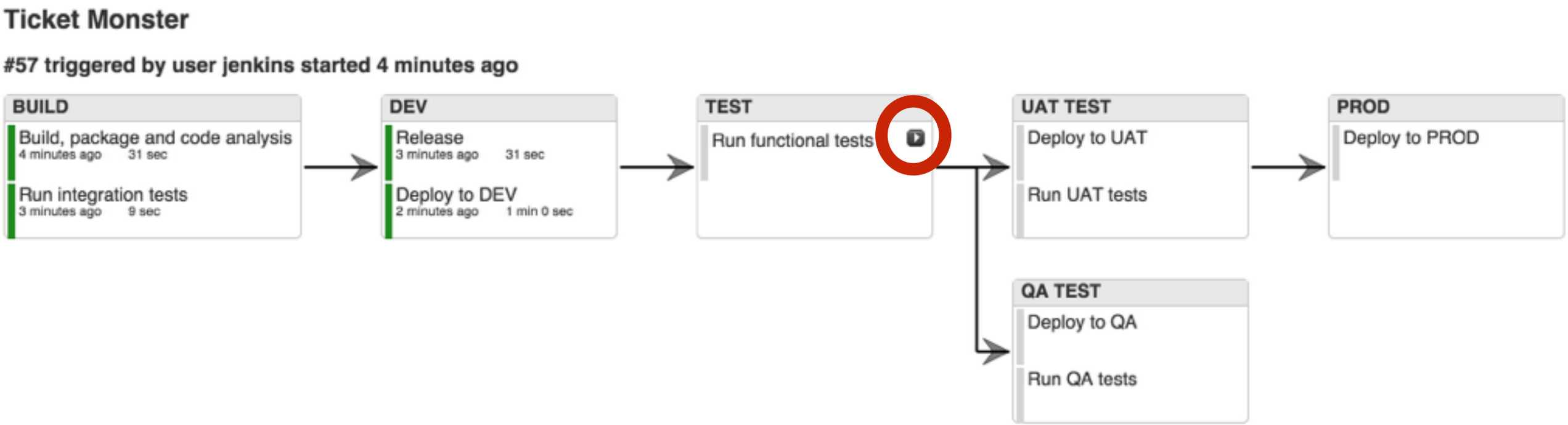
Deployment Pipeline with PaaS



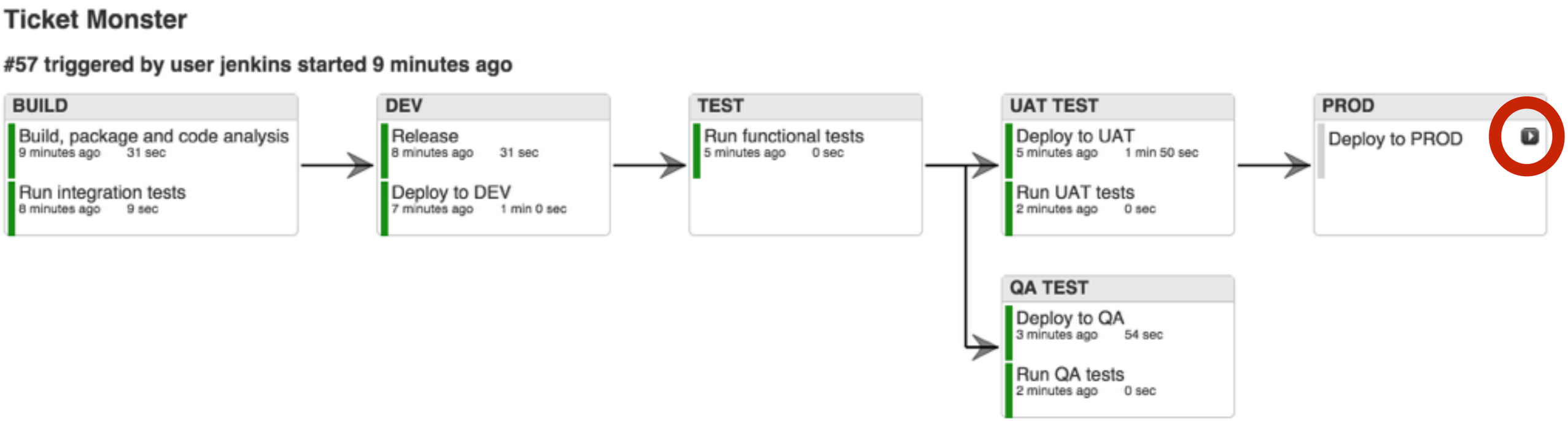
Deployment Pipeline with Containers



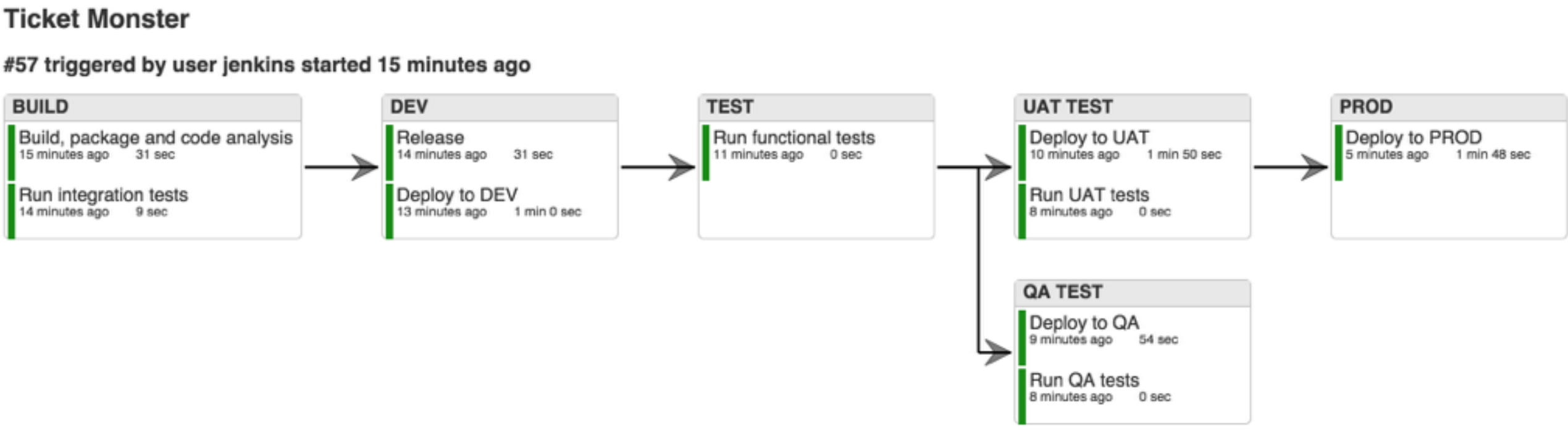
Build Server



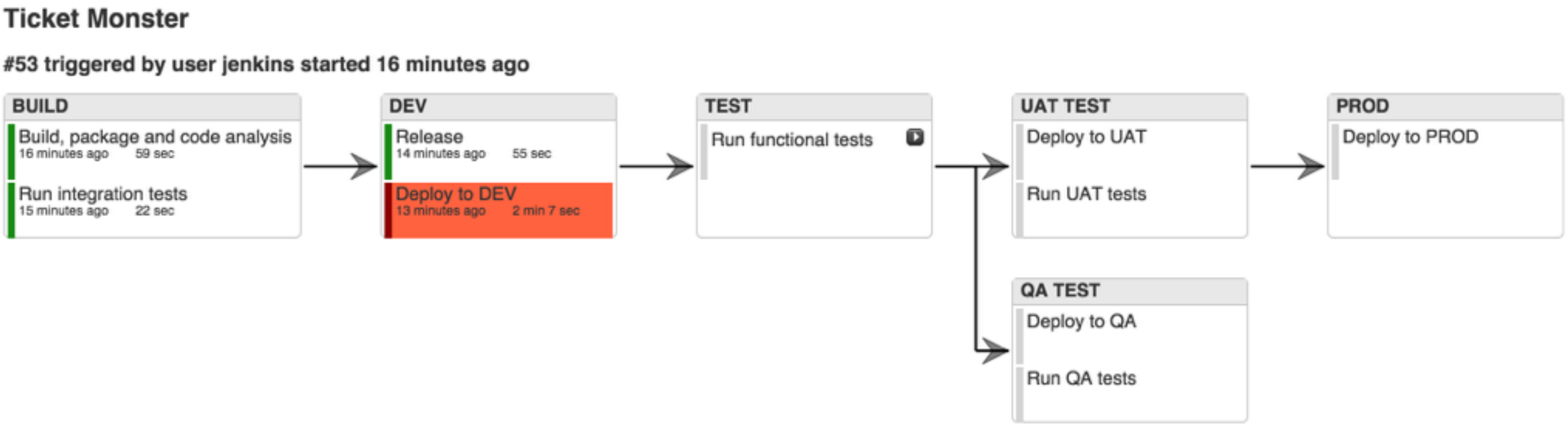
UAT and QA Tests



Deployed to Production



Failed Tests



References

- github.com/arun-gupta/devops-javaee