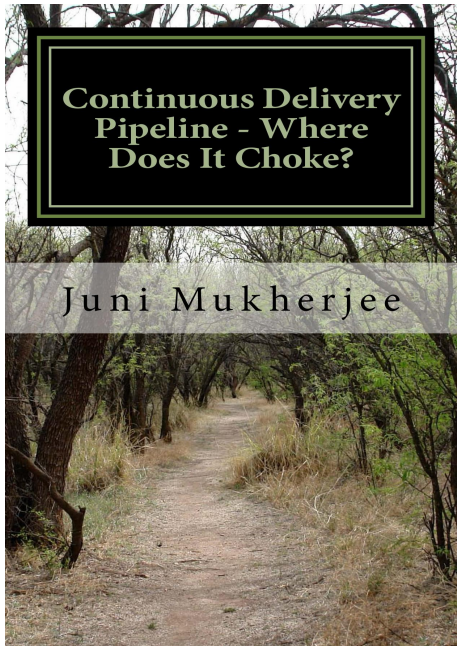
Juni Mukherjee
(@JuniTweets @CloudBees)

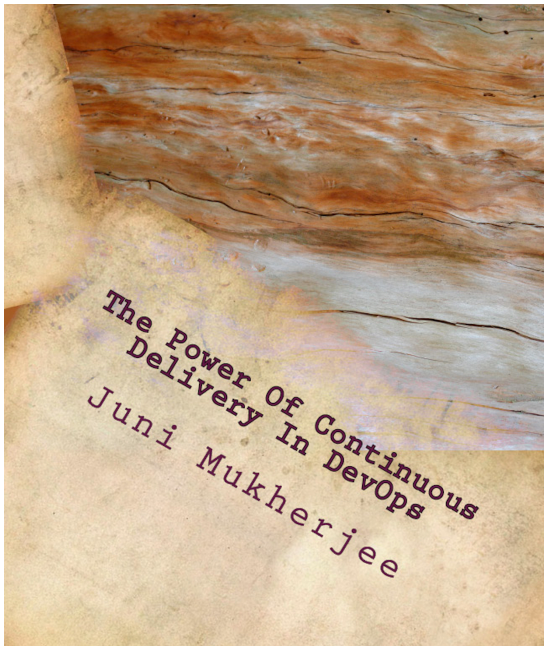
The Twelve-Factor Pipeline

https://continuity.world

AGILE2018
SAN DIEGO
AUGUST 6-10



https://continuity.world/2015-book



https://continuity.world/2017-book

Every business is a software business, and under pressure to innovate constantly. This increased velocity introduces new business risks.

CloudBees is building the world's first end-to-end automated software delivery system, enabling companies to balance governance and developer freedom.

https://www.cloudbees.com

#	Class/category	Solution (Not meant to be exhaustive…)
1	Orchestrator	Jenkins, GitLab, GoCD, TeamCity, TravisCI, CodeShip, CodePipeline ..
2	Source code repo	GitHub, Bitbucket, CodeCommit, SVN, ..
3	Artifact repo	Artifactory, Nexus, S3, HockeyApp, ..
4	Dashboard	SumoLogic, ..
5	IaaS	AWS, Azure, ..
6	PaaS	CloudFoundry, Heroku, ..
7	Analytics	DevOptics, CloudWatch, New Relic, Dynatrace, Crashlytics, ..
8	Container ecosystem	Docker, CoreOS, Rocket, Swarm, Kubernetes, Mesos, ECS, ..
9	Audit trail	CloudTrail, .. **(never turn it off!)**
10	SAST	Coverity, …
11	DAST	OWASP ZAP, ..
12	Code coverage	Cobertura, JaCoCo, ..

#	Class/category	Solution (Not meant to be exhaustive…)
13	Static code analysis	Sonar, ESLint, Taylor, Lint, ..
14	Functional test	TestNG, Webdriver/Selenium, SauceLabs (Selenium on the cloud), Protractor (Node.js), Appium (Mobile), ..
15	Performance test	JMeter, BlazeMeter (JMeter on the cloud), ..
16	Unit test	JUnit (Java), Jasmine (Node.js), ..
17	Feature Flagging	LaunchDarkly, ..
18	A/B tests	Optimizely, ..
19	Build	Npm (Node.js), Maven(Java), Gradle(Java, Android), ..
20	Database	Liquibase/Datical, Flyway, ..
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Agenda

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- Introduction to pipelines
- 12 factors applied to pipelines
- Pipeline analytics and insights
- Jenkins X (what happened to Jenkins?)

DevOps World

Jenkins World

The Event for Everything Jenkins & DevOps

September 16-19, 2018
San Francisco, CA

October 23-25, 2018
Nice, France

Presented by
cloudbees

Agenda

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AUGUST 6-10

- **Introduction to pipelines**
- 12 factors applied to pipelines
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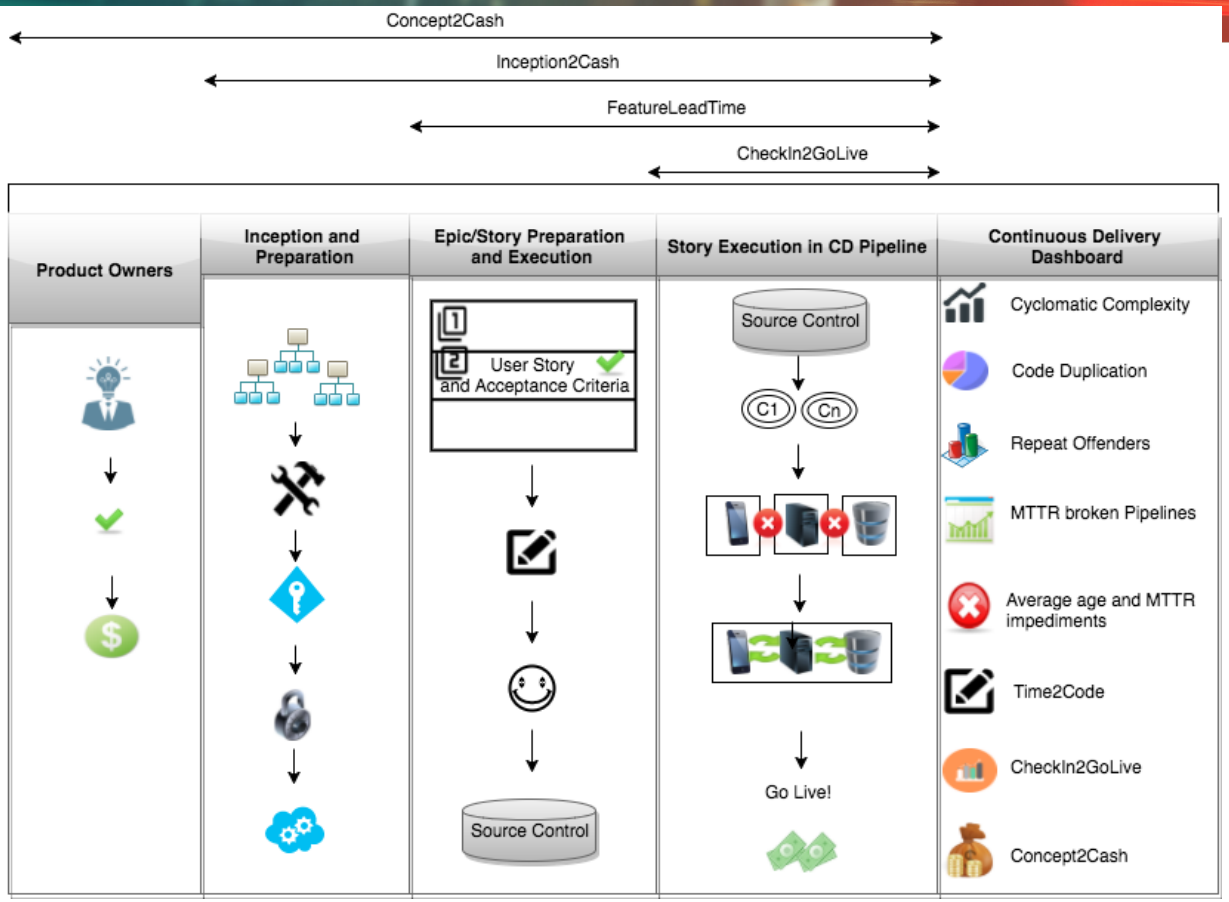
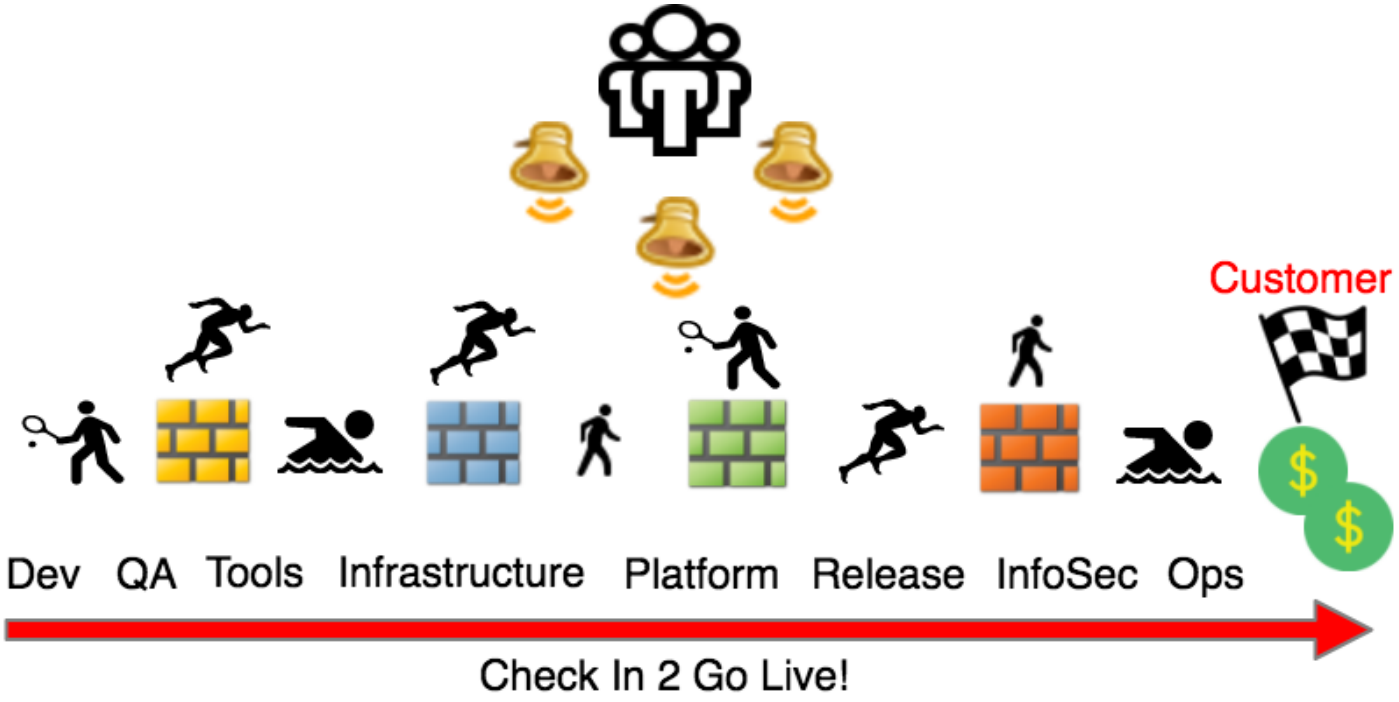
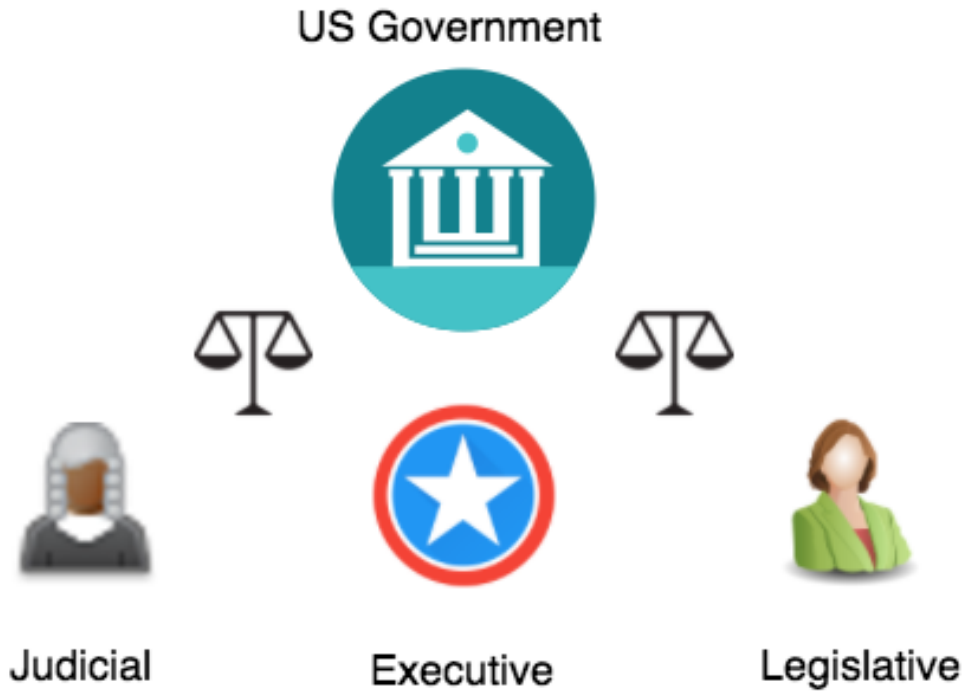
Concept to Cash




Customer
Dev
QA
Tools
Infrastructure
Platform
Release
InfoSec
Ops
Check In 2 Go Live!

Continuous Everything

Segregation of Duties (SoD)



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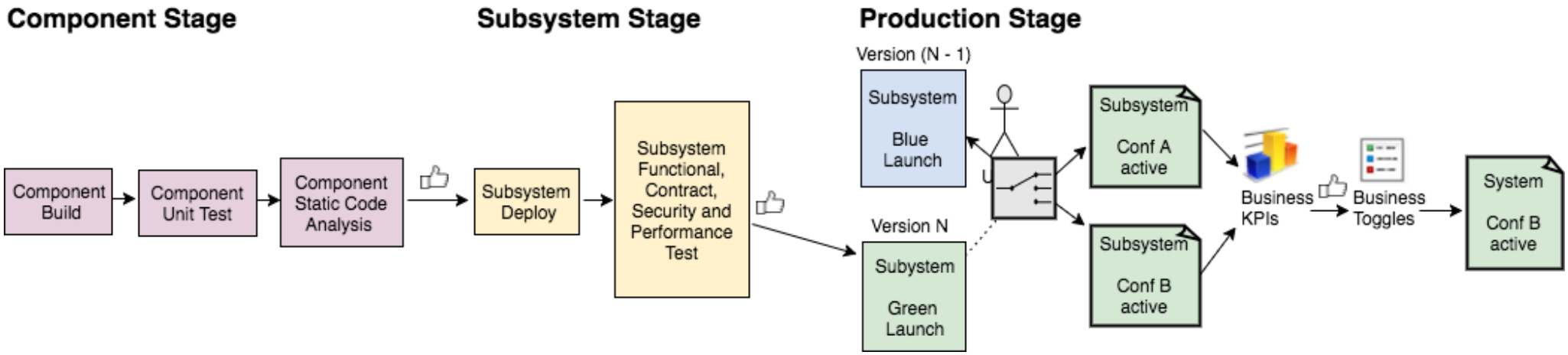
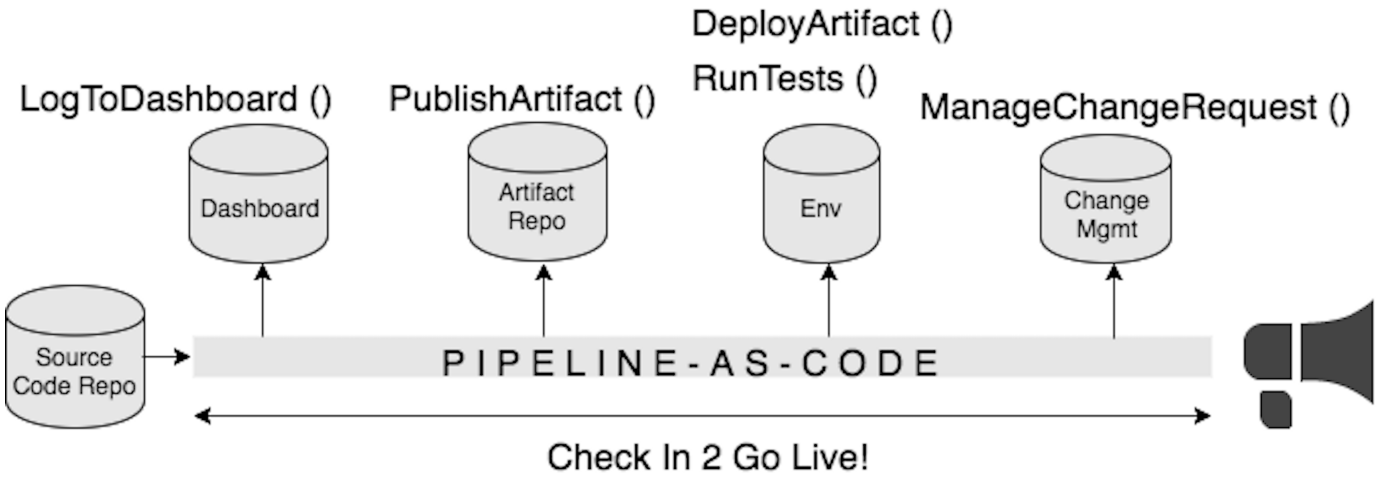
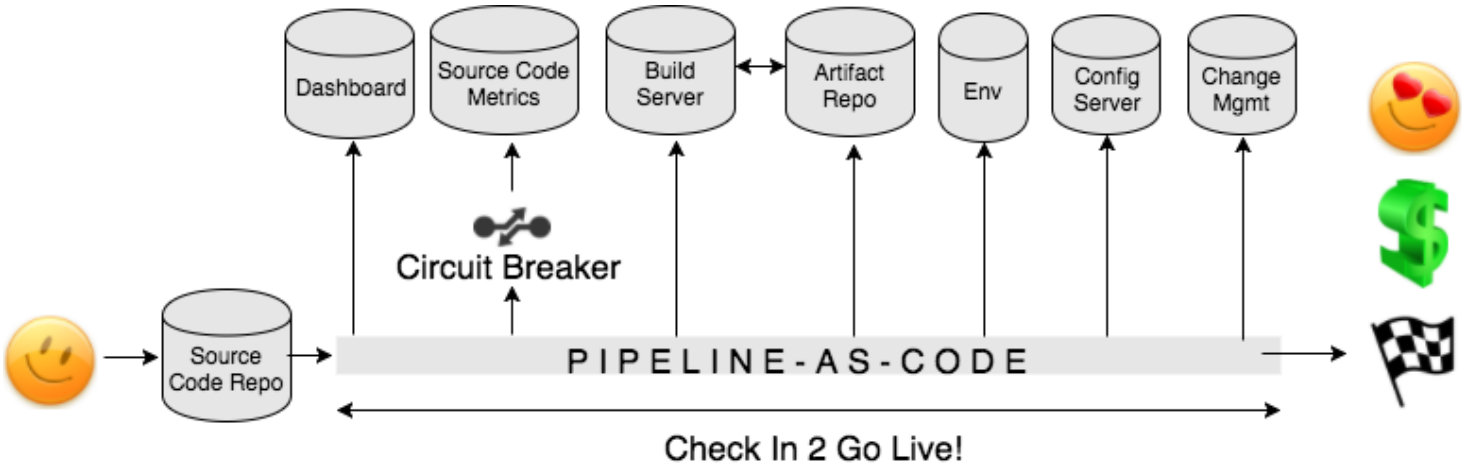
Factor I: Codebase
One codebase tracked in revision control, many deploys



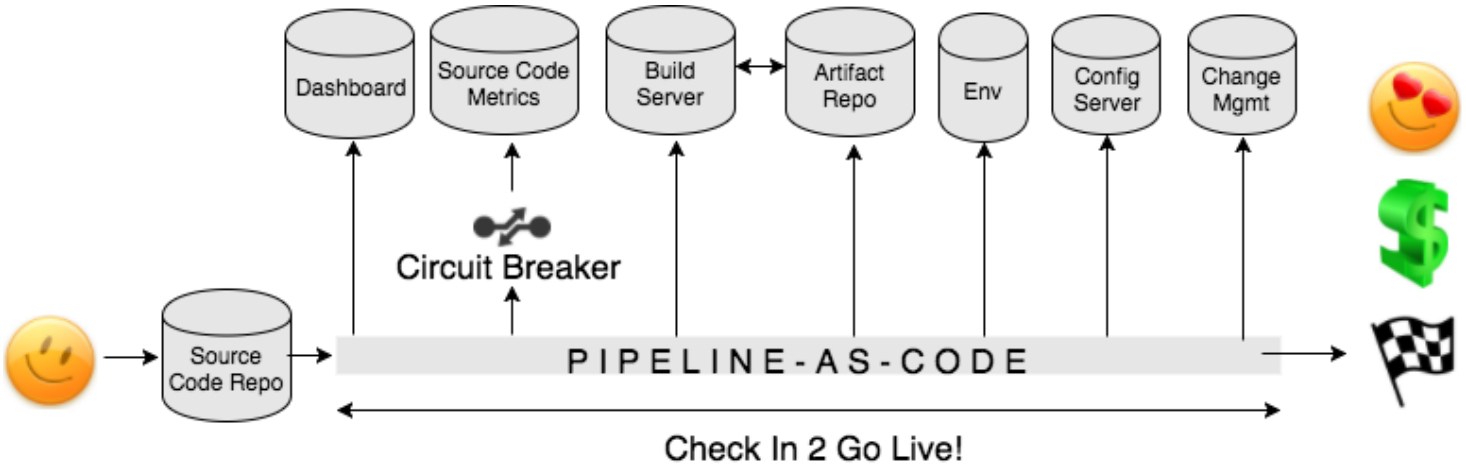
Factor II: Dependencies
Explicitly declare and isolate dependencies



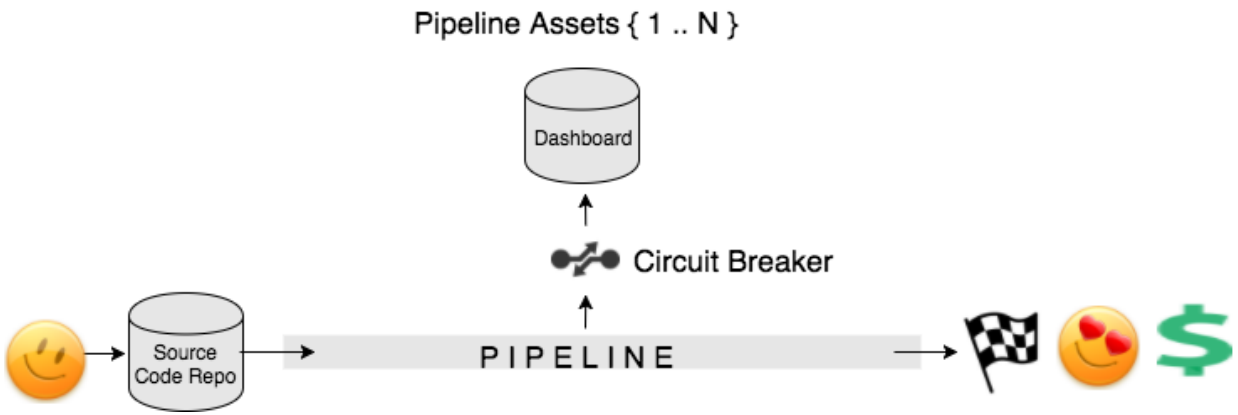
Factor III: Config
Store config in the environment



Factor IV: Backing services
Treat backing services as attached resources



Factor IV (continued): Backing services
Treat backing services as attached resources



Factor V: Build, release, run
Strictly separate build, release and run stages

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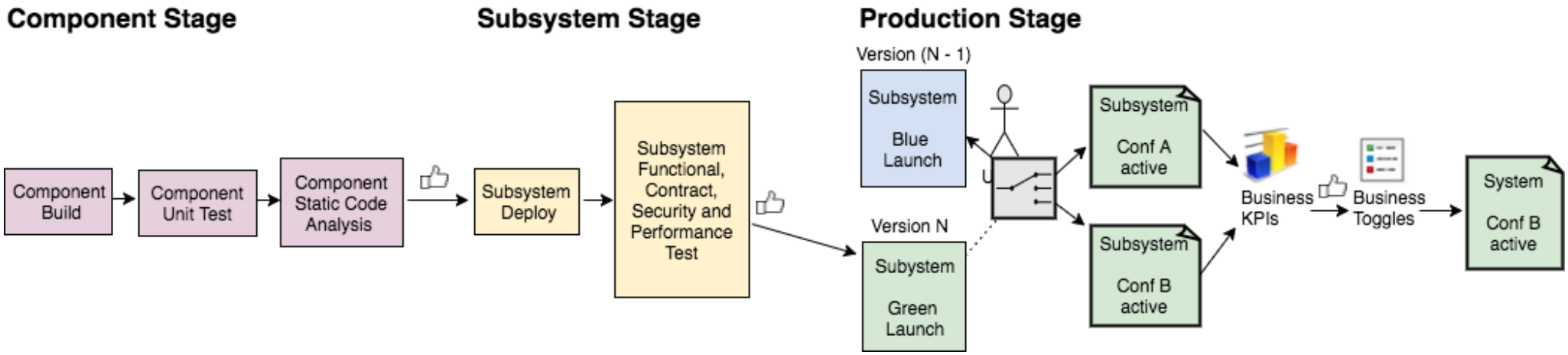
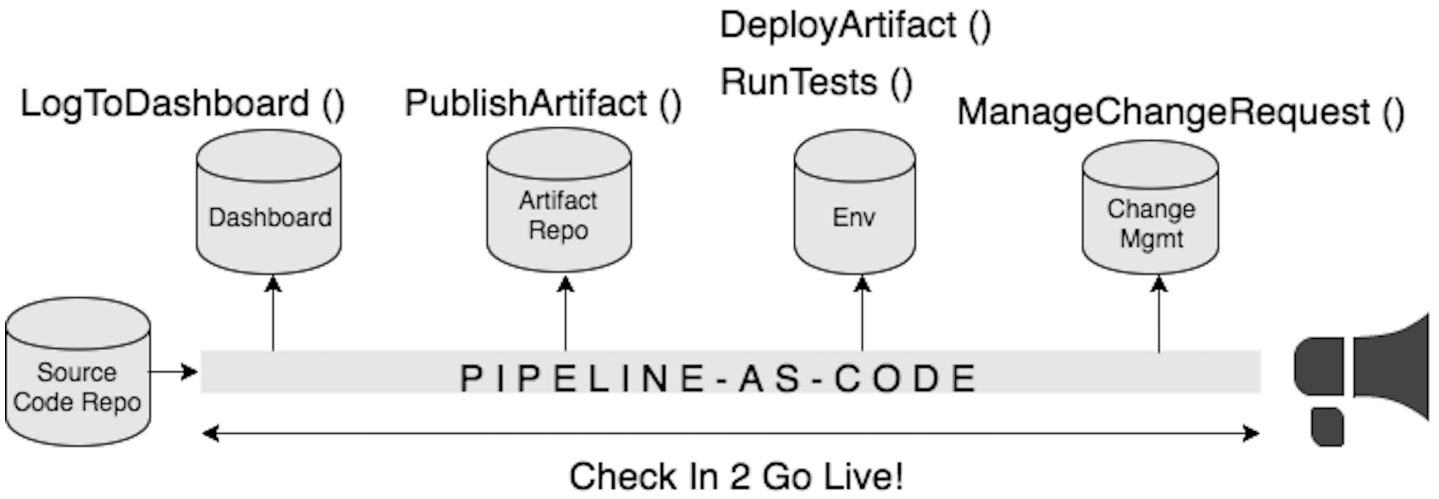


Factor VI: Processes
Execute the app as one or more stateless processes



Factor VII: Port binding
Export services via port binding

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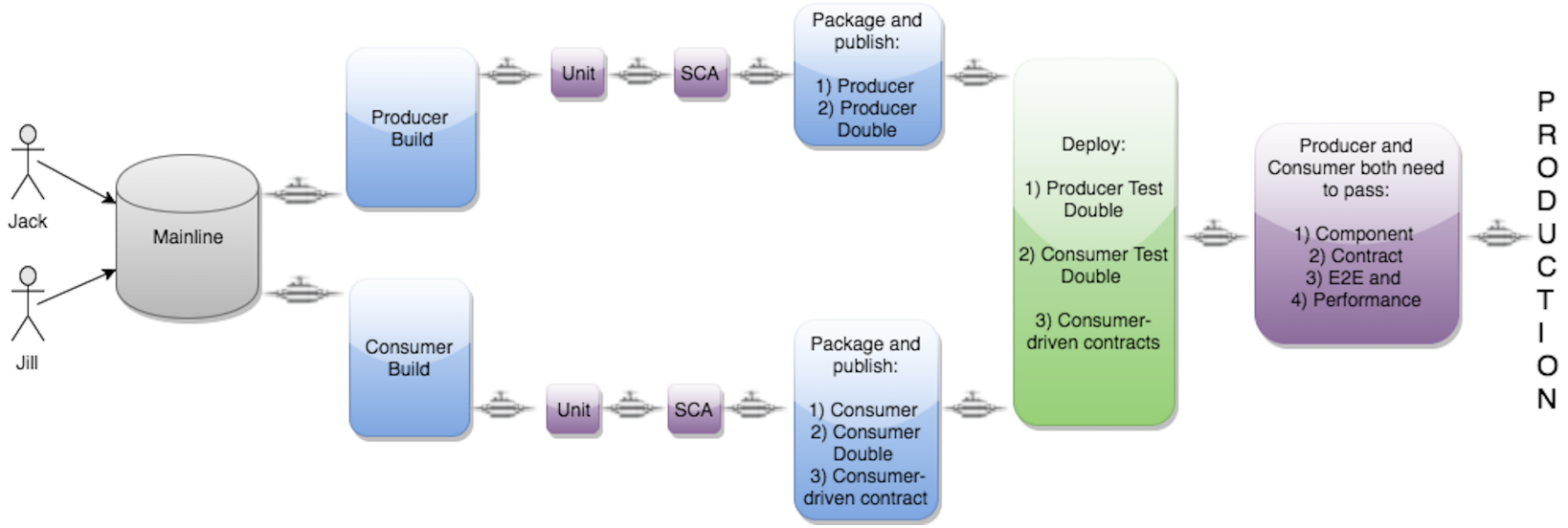
- The 12-factor app is completely self-contained
- One app can become the backing service for another app

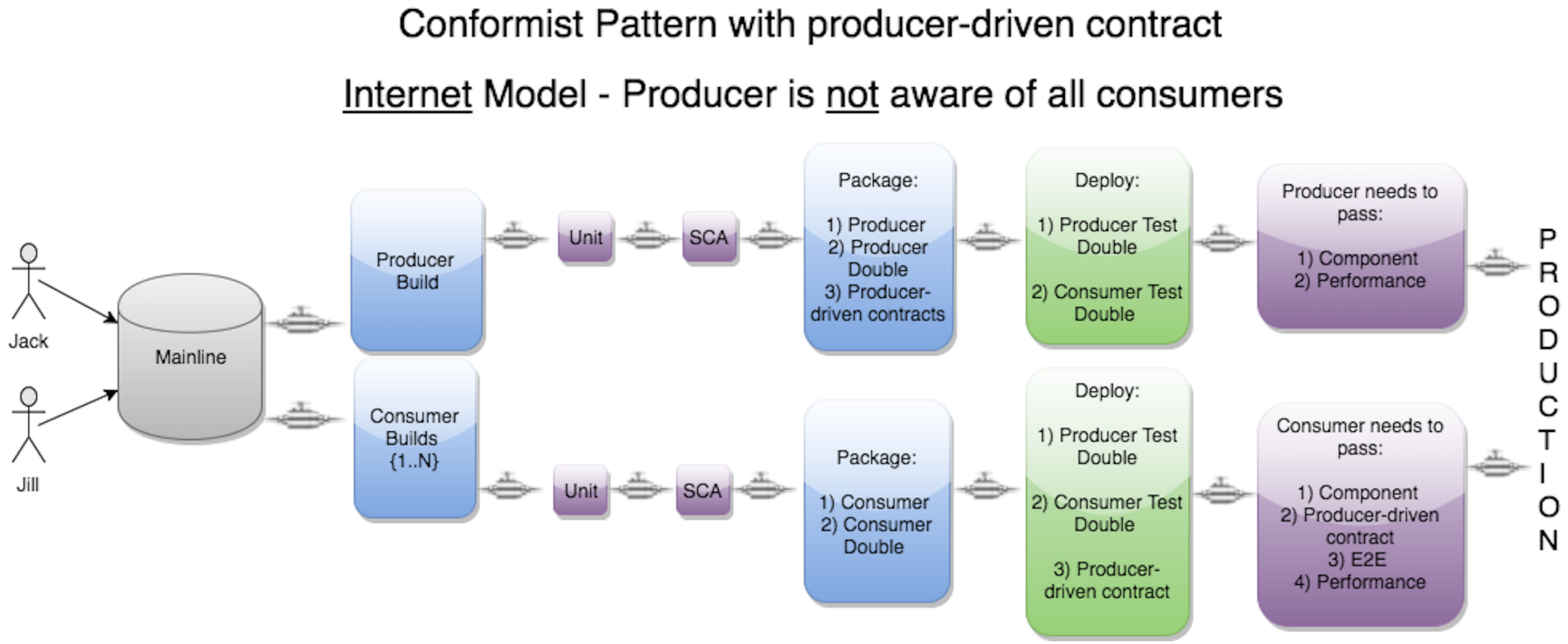
Factor VIII: Concurrency
Scale out via the process model

Customer Supplier Pattern with consumer-driven contract

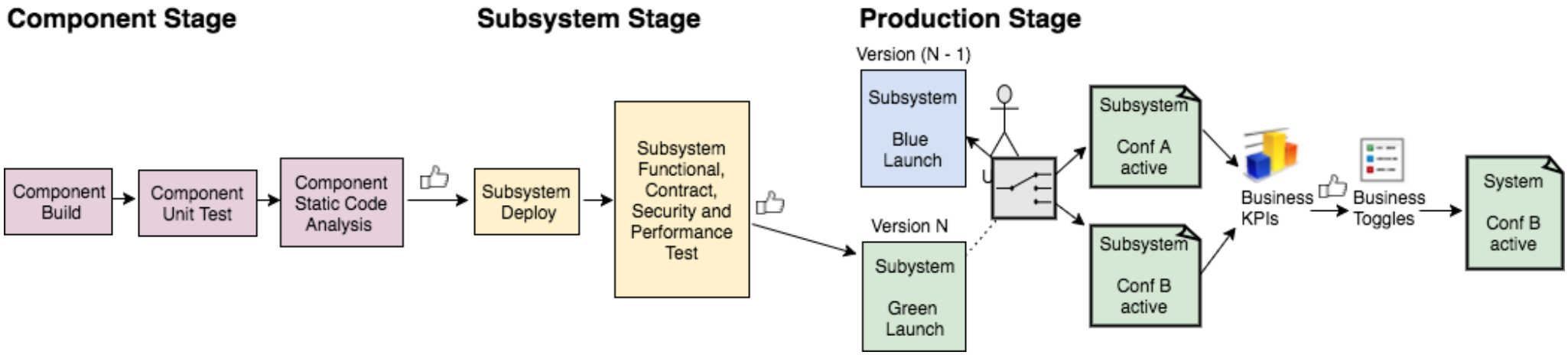
Intranet Model - Producer is aware of all Consumers



Factor IX: Disposability
Maximize robustness with fast startup and graceful shutdown



Factor X: Dev/prod parity
Keep dev/test, staging, and prod similar



- ☑ Time
- ☑ Personnel
- ☑ Tools

Factor XI: Logs
Treat logs as event streams

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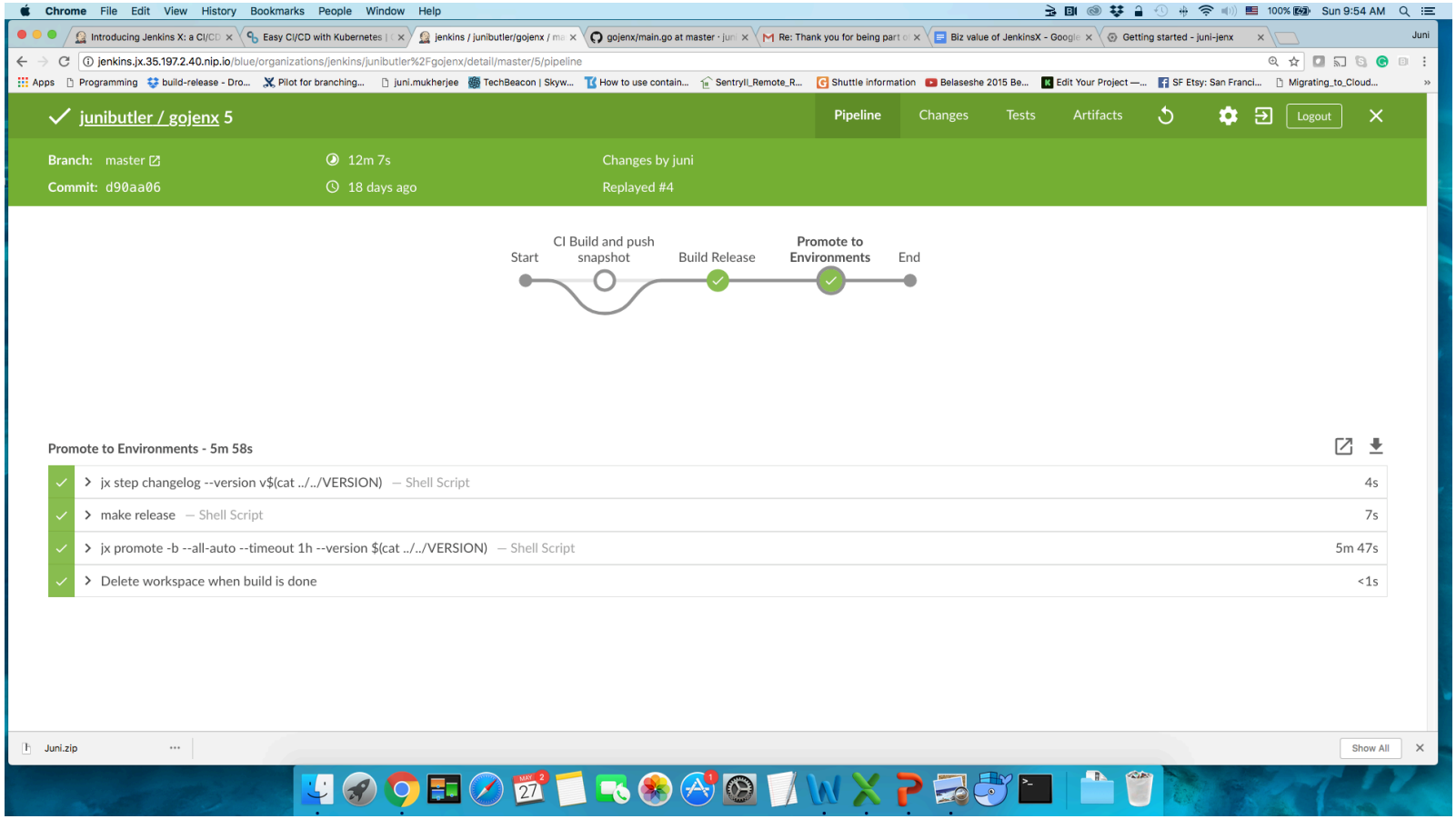

Factor XII: Admin processes
Run admin/management tasks as one-off processes

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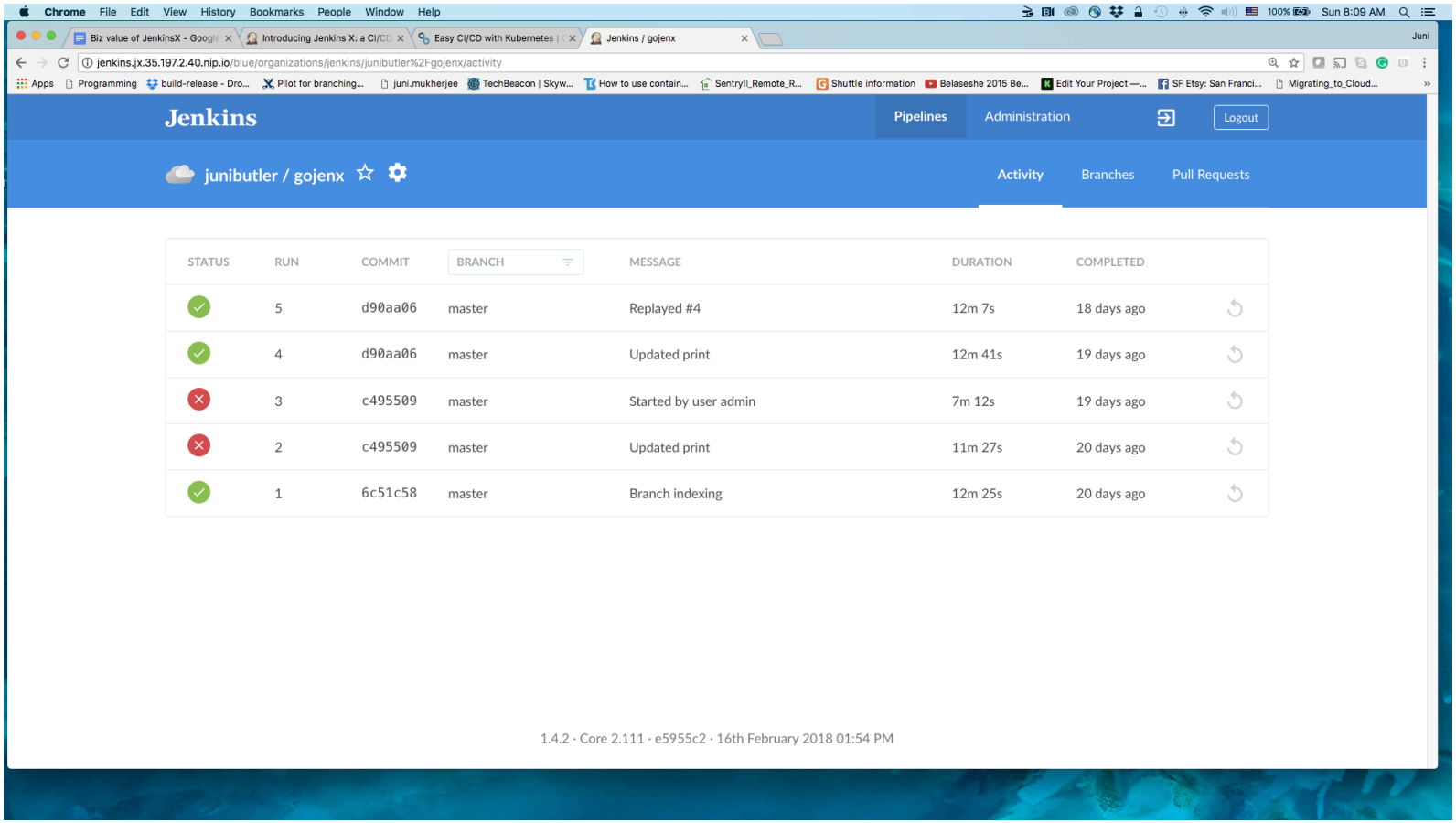

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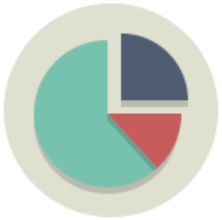
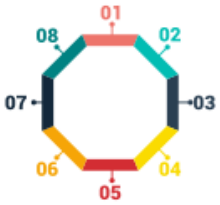
- Jenkins X (what happened to Jenkins?)

Factor XII (continued): Admin processes
Run admin/management tasks as one-off processes



Pipeline deploys on Dev
Pipeline deploys on Stage
Pipeline deploys in Production



Pipeline failures due to Unit Tests
Pipeline failures due to Functional Tests
Pipeline failures due to Performance Tests
Pipeline failures due to Security Vulnerabilities
::::::::::
::::::

Pipeline failures in Dev
Pipeline failures in Stage
Pipeline failures in Production
# of Escaped Defects

Business Value Per Sprint

Not # of releases
Not # of tests executed

Stability Index=
Fn (CheckIn2GoLive,
# of Escaped Defects,
Customer Delight,
::::)

Code Quality = Fn (
Cyclomatic Complexity,
Code Duplication,
Unit Test Coverage)

CheckIn2Dev
CheckIn2Stage
CheckIn2GoLive!

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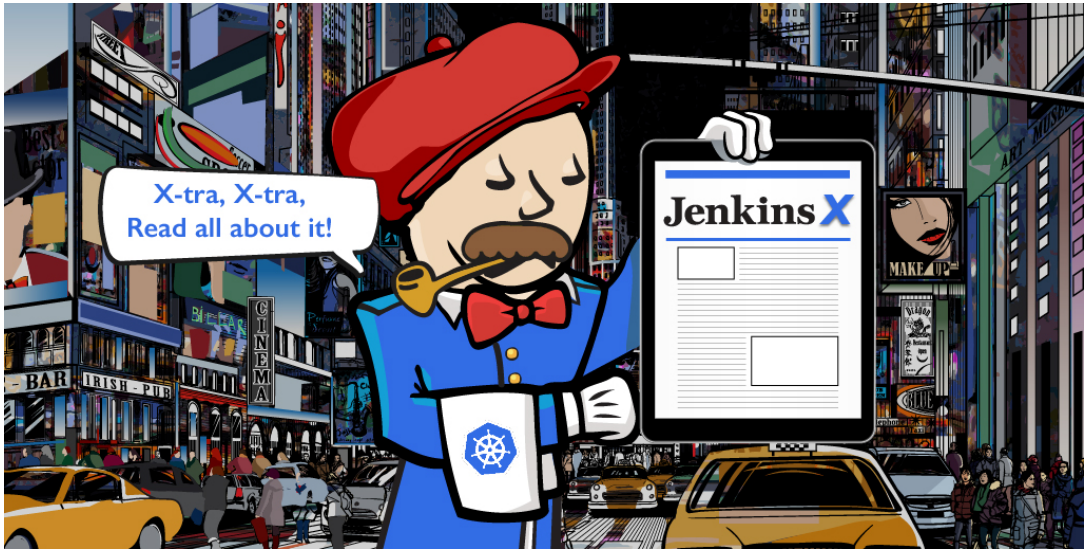
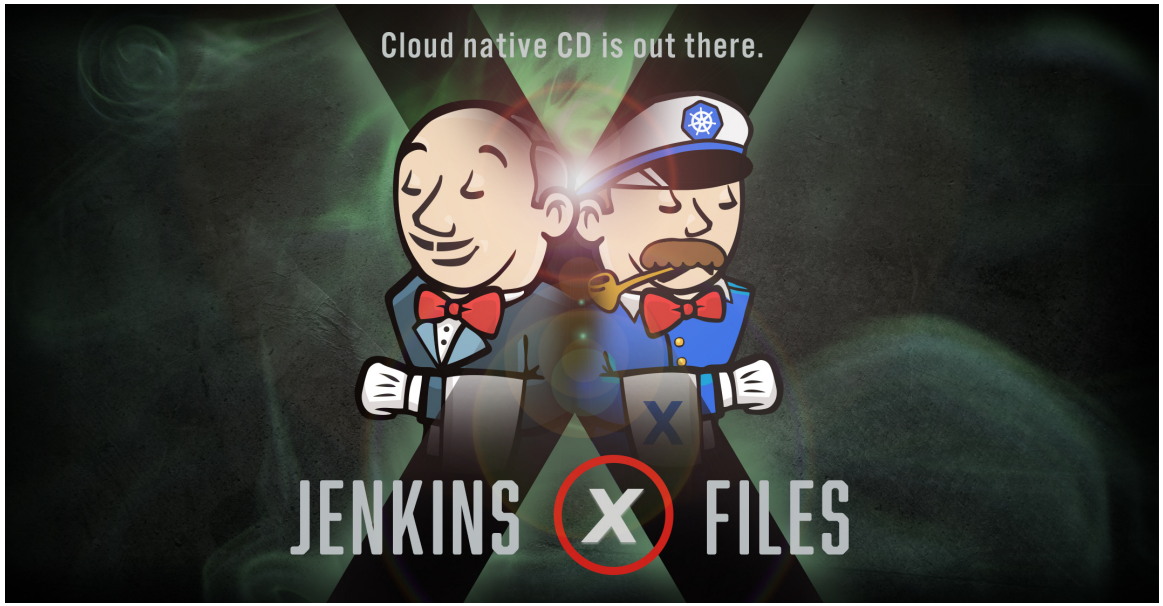
Jenkins X = CD + Kubernetes



Business value that Jenkins X brings to organizations

https://www.cloudbees.com/blog/|@cloudbees

Jenkins X = CD + Kubernetes



Under the hood of Jenkins X

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Thank you!