



Continuous Integration

What you (probably) don't know and why you should care?

Who am I?

Łukasz Rybka



Co-lecturer
(2014)



Co-lecturer
(2015)



Lecturer
(2015)

infoShare
ACADEMY

Trainer
(2016)



CTO
(2017)

Othot

Software Architect
(2017)

+ Physicist by education

+ With IT industry for 10+ years

Agenda

- // Continuous Integration – what it is and what it's not?
- // What kind of problems does it solve?
- // How to apply the rules of CI to your day-to-day development life?
- // Continuous Integration servers – what are these for?
- // Patterns and anti-patterns of working with teams
- // I know CI – what's next for me?

Disclaimer

// Have a question? Please ask! 😊

// Slides are for me to navigate through the presentation, not much of a value to the audience in them.

// Everything I say is opinionated

// Truly sorry for my English, I'm not a native speaker

Question



Who has non-academic experience?

Question



Who has commercial experience?



Question



Who knows Agile and Scrum methodologies?



Agile Manifesto

AGILE

Manifesto for Agile Software Dev.

- INDIVIDUALS AND INTERACTIONS OVER PROCESSES AND TOOLS
- WORKING SOFTWARE OVER COMPREHENSIVE DOCUMENTATION
- CUSTOMER COLLABORATION OVER CONTRACT NEGOTIATION
- RESPONDING TO CHANGE OVER FOLLOWING A PLAN



Motivation

„A man who dares to waste one hour of time has not discovered the value of life”

Charles Darwin



Motivation

„I choose a lazy person to do a hard job. Because a lazy person will find an easy way to do it.”

Bill Gates

A bit of history...

„The New New
Product Development
Game” (Scrum)

„Extreme
Programming
explained: Embrace
Change”

Agile Manifesto

1986

March 1996

1999

February 2000

February 2001

February 2011

Chrysler
Comprehensive
Compensation System
(Kent Beck)

End of C3 System

Jenkins CI

Common Misconception

Continuous Integration: Its History and Benefits

This post provides an overview of the origins and basic methodologies of continuous integration for those who might not be familiar.



by Soumyajit Basu · MVB · May. 23, 17 · DevOps Zone · Opinion



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Read why times series is the [fastest growing database](#) category.

“Continuous Integration,” or “CI” for short, is a concept which has been taken as a standard nowadays within our IT services and development. The concept of continuous integration means automating the overall deployment process for an application after a code has been committed. It helps in reducing bugs in the deployment process. Besides this, it also helps in reducing complexity within the code and increases clarity in each module.

Other incorrect definitions

// „Tool for running unit tests”

// „Tool for deploying newest changes to development and production environments”

// „Tool for static code analysis”

// „Tool for preparing binary distribution of our product”

What it actually is?

// Originated in Extreme Programming (XP)

// **Practice in software engineering**

// Assumes frequent integrations next, smaller changes in code with main development branch

// Commonly teams assumes multiple integrations per day, about 1 integration per programmer each day

What are the benefits

// Avoiding „merging hell”

// Helps to quickly catch architectural errors

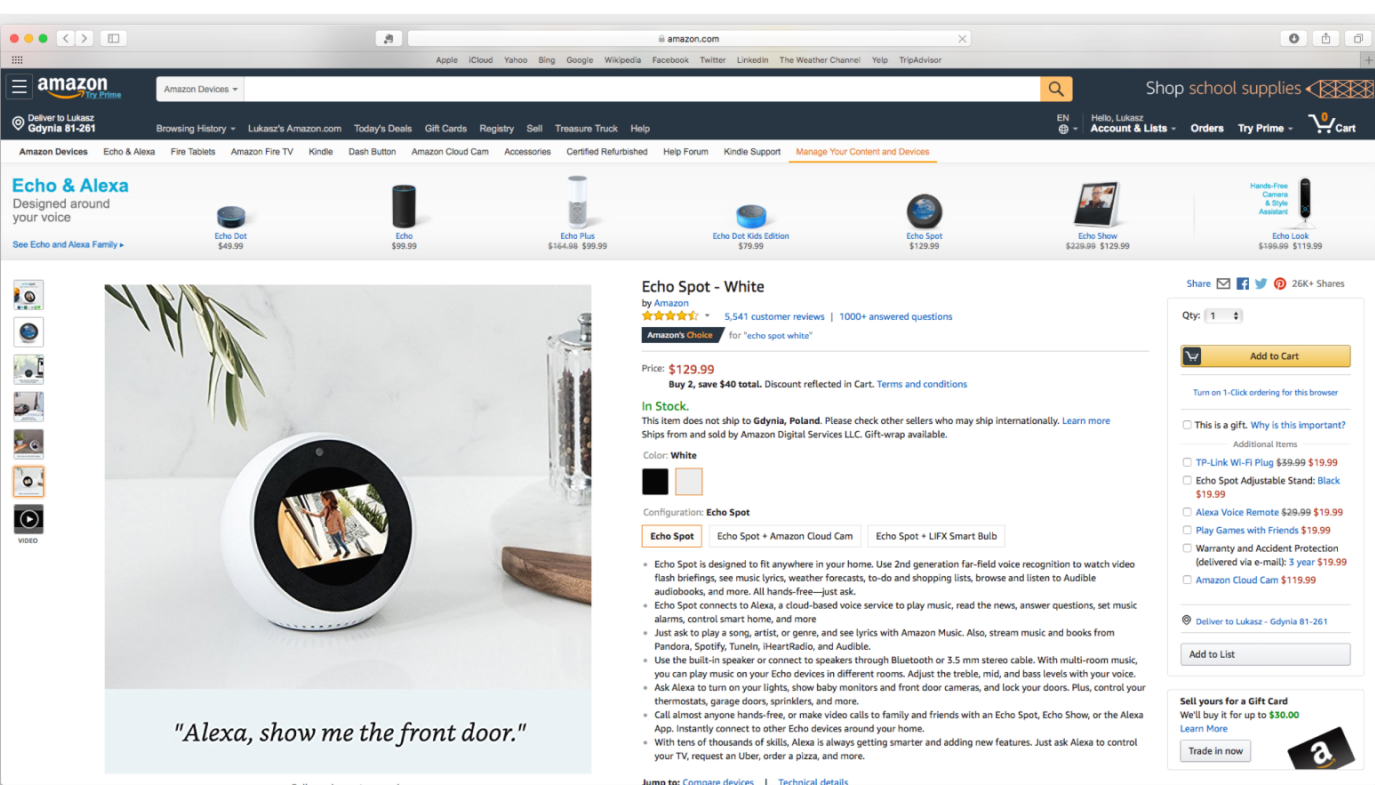
// Makes conversation between development team and product owner a lot easier

// Introduces new, more efficient and standardized process for working with tasks

Example task/issue



Example task/issue



The screenshot shows the Amazon website interface. At the top, there's a navigation bar with the Amazon logo, delivery location (Gdynia 81-261), and various links. Below this is a search bar and a category bar. The main content area features a large image of the Echo Spot device, which is a small, round, white smart speaker with a screen. To the right of the image, the product name 'Echo Spot - White' is displayed, along with its price (\$129.99) and customer reviews. Below the product name, there's a section for 'Additional Items' with a list of recommended products. At the bottom of the page, there's a quote: "Alexa, show me the front door."

Echo Spot - White
by Amazon
★★★★★ | 5,541 customer reviews | 1000+ answered questions
Amazon's Choice for "echo spot white"

Price: **\$129.99**
Buy 2, save \$40 total. Discount reflected in Cart. [Terms and conditions](#)

In Stock.
This item does not ship to Gdynia, Poland. Please check other sellers who may ship internationally. [Learn more](#)
Ships from and sold by Amazon Digital Services LLC. Gift-wrap available.

Color: **White**

Configuration: **Echo Spot**

Echo Spot | Echo Spot + Amazon Cloud Cam | Echo Spot + LIFX Smart Bulb

- Echo Spot is designed to fit anywhere in your home. Use 2nd generation far-field voice recognition to watch video flash briefings, see music lyrics, weather forecasts, to-do and shopping lists, browse and listen to Audible audiobooks, and more. All hands-free—just ask.
- Echo Spot connects to Alexa, a cloud-based voice service to play music, read the news, answer questions, set music alarms, control smart home, and more.
- Just ask to play a song, artist, or genre, and see lyrics with Amazon Music. Also, stream music and books from Pandora, Spotify, TuneIn, iHeartRadio, and Audible.
- Use the built-in speaker or connect to speakers through Bluetooth or 3.5 mm stereo cable. With multi-room music, you can play music on your Echo devices in different rooms. Adjust the treble, mid, and bass levels with your voice.
- Ask Alexa to turn on your lights, show baby monitors and front door cameras, and lock your doors. Plus, control your thermostats, garage doors, sprinklers, and more.
- Call almost anyone hands-free, or make video calls to family and friends with an Echo Spot, Echo Show, or the Alexa App. Instantly connect to other Echo devices around your home.
- With tens of thousands of skills, Alexa is always getting smarter and adding new features. Just ask Alexa to control your TV, request an Uber, order a pizza, and more.

Additional Items

- ☐ TP-Link Wi-Fi Plug **\$39.99 \$19.99**
- ☐ Echo Spot Adjustable Stand: **Black \$19.99**
- ☐ Alexa Voice Remote **\$29.99 \$19.99**
- ☐ Play Games with Friends **\$19.99**
- ☐ Warranty and Accident Protection (delivered via e-mail): 3 year **\$19.99**
- ☐ Amazon Cloud Cam **\$119.99**

Deliver to Lukasz - Gdynia 81-261

Add to List

Share 26K+ Shares

Qty: 1

Add to Cart




Turn on 1-Click ordering for this browser

See yours for a Gift Card
We'll buy it for up to **\$30.00**
[Learn More](#)

Trade in now

Jump to: [Compare devices](#) | [Technical details](#)

Example task/issue

Shopping Cart		Price	Quantity
	Fire TV Cube Hands-Free with Alexa and 4K Ultra HD Streaming Media Player <small>In Stock</small> Eligible for FREE Shipping <input type="checkbox"/> This is a gift Learn more Delete Save for later	\$119.99 <small>Join Prime to save \$40.00 on this item</small>	1
	AmazonBasics High-Speed HDMI Cable, 3 Feet, 1-Pack <small>In Stock</small> Eligible for FREE Shipping <input type="checkbox"/> This is a gift Learn more Delete Save for later	\$5.99	1
	Echo Spot - White <small>In Stock</small> Eligible for FREE Shipping <input type="checkbox"/> This is a gift Learn more Delete Save for later	\$129.99	1
		Subtotal (3 items): \$255.97	

Typical questions from management



„How long will it take?“

„When can I see it?“

„We only asked for one checkbox, why do you need 3 weeks for it?“

„Continuous” Approach

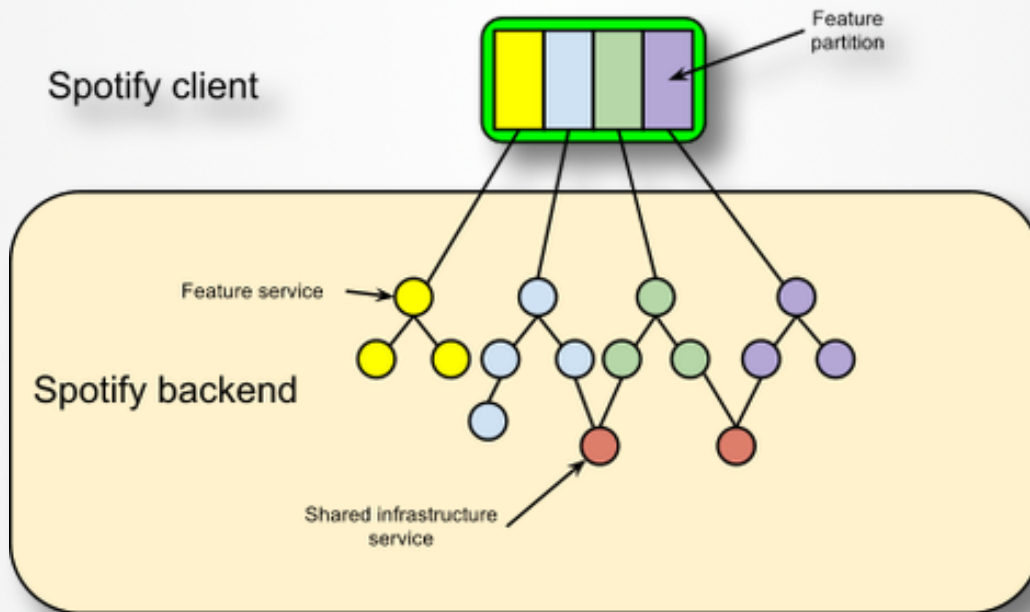


Typical concerns



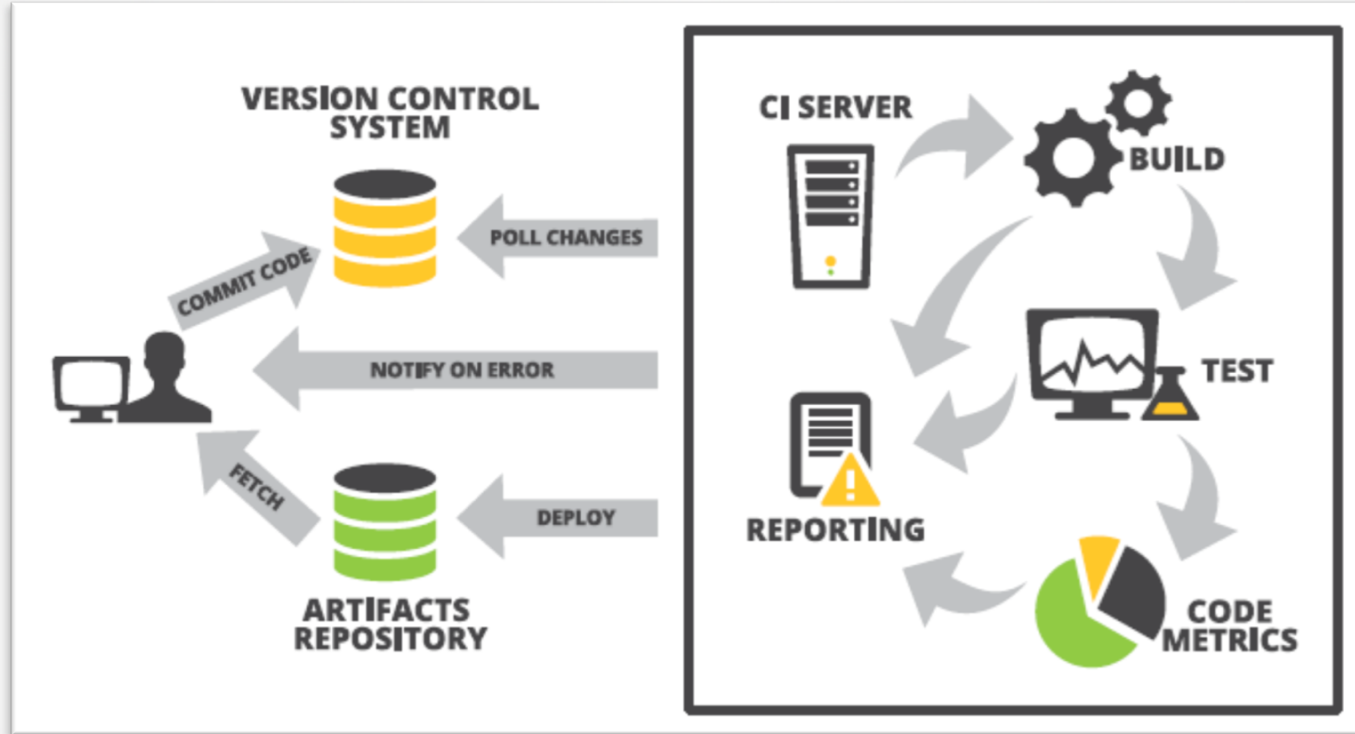
„What if I don't want to ship unfinished feature to clients and deployment is very close?“

Feature toggle – Spotify architecture





Automation



Continuous Integration servers



Hudson



Jenkins

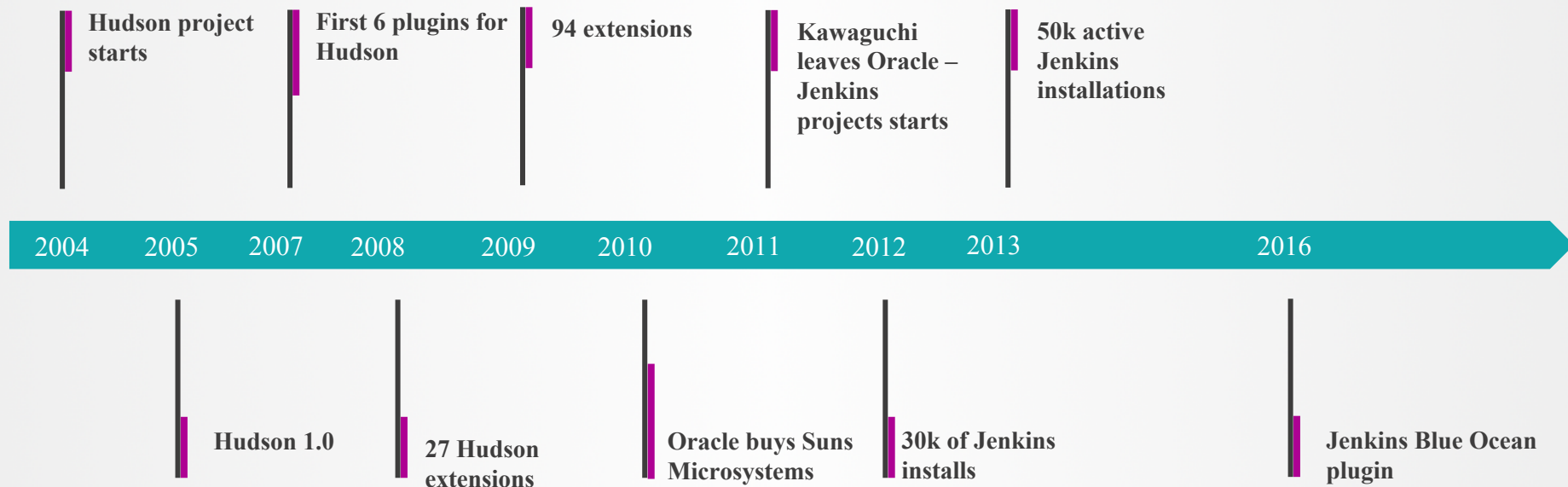


Jenkins

„I had this great idea of a web framework, and I wanted an excuse to actually implement it. This was around the time when everyone had his own framework, so I suppose I couldn't help myself.”

Kohsuke Kawaguchi

Jenkins history


























Jenkins features

- // Easy to install – Docker image
- // Weekly updates
- // Build as a group of core plugins
- // Huge database of plugins
- // Easy to learn and use
- // Platform and programming language agnostic
- // Elastic
- // Built-in scripting mechanism
- // Very scalable (master/slave model)



Jenkins interface




Jenkins				
Pipelines		Administration		Logout
Pipelines	<input type="text" value="Search pipelines..."/>			New Pipeline
NAME	HEALTH	BRANCHES	PR	
othot-admin-db		18 passing	14 passing	
othot-admin-db-release		-	-	
othot-core-release		-	-	
othot-customer-db		19 passing	16 passing	
othot-customer-db-release		-	-	
othot-data-science-engine-publish		-	-	
othot-external-api		13 passing	10 passing	
othot-external-api-release		-	-	
othot-model-build-queue-release		-	-	
othot-platform-api-release		-	-	
othot-platform-app		23 failing	22 passing	

Jenkins interface





















Jenkins

Pipelines Administration

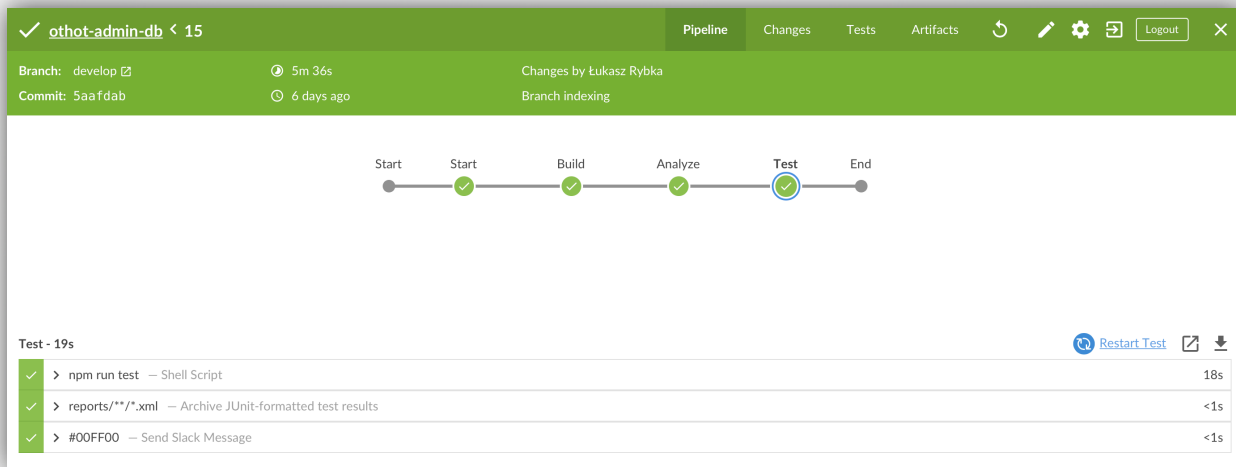
Logout

 othot-admin-db
 


Activity Branches Pull Requests

STATUS	RUN	COMMIT	BRANCH	MESSAGE	DURATION	COMPLETED	
	15	5aaf dab	develop	OP-3088 Extended models with columns storing...	5m 36s	6 days ago	
	1	bf3c141	OP-3088-replacement-f...	Branch indexing	6m 21s	6 days ago	
	1	bf3c141	PR-27	Branch indexing	56s	7 days ago	
	3	b95447c	release2.0-patch4	Branch indexing	26s	11 days ago	
	2	2cce9f5	master	add logging flag	49s	11 days ago	
	1	b95447c	PR-26	Branch indexing	1m 58s	11 days ago	
	1	019caed	release2.0-patch4-dev-...	Branch indexing	1m 35s	11 days ago	
	14	1507e98	develop	add logging flag	49s	11 days ago	
	3	d500a46	feature/OP-3008	Branch indexing	46s	14 days ago	
	13	dab022b	develop	OP-3008 - added support for workqueue extern...	1m 34s	14 days ago	
	2	b95447c	release2.0-patch4	add logging flag	9m 25s	15 days ago	

Jenkins interface



The screenshot shows the Jenkins web interface for a pipeline job named "othot-admin-db". The interface has a green header bar with the job name and a "Pipeline" tab selected. Below the header, there's a summary section showing the branch "develop", commit "5aafdab", and a build duration of "5m 36s". The main part of the interface displays a pipeline graph with stages: Start, Start, Build, Analyze, Test, and End. The "Test" stage is currently selected and highlighted with a blue circle and a green checkmark. Below the graph, there's a table showing the details of the "Test" stage, which took "19s" to complete. The table lists three steps: "npm run test" (Shell Script, 18s), "reports/**/*.xml" (Archive JUnit-formatted test results, <1s), and "#00FF00" (Send Slack Message, <1s).

✓ othot-admin-db < 15

Pipeline Changes Tests Artifacts ↺ ✎ ⚙️ 📄 Logout ✕

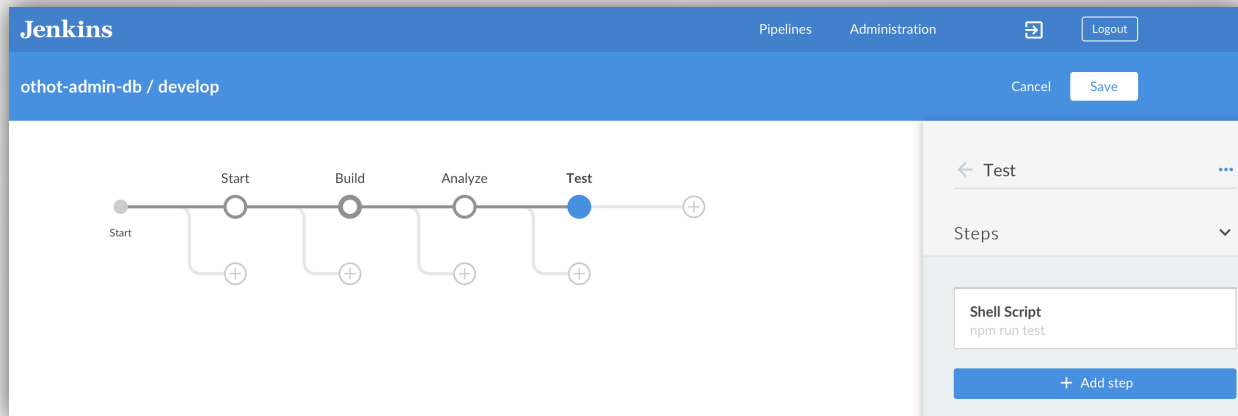
Branch: develop ⓘ 5m 36s Changes by Łukasz Rybka
Commit: 5aafdab 6 days ago Branch indexing

Start Start Build Analyze Test End

Test - 19s [Restart Test](#) 📄 ⬇️

✓	> npm run test — Shell Script	18s
✓	> reports/**/*.xml — Archive JUnit-formatted test results	<1s
✓	> #00FF00 — Send Slack Message	<1s

Jenkins interface





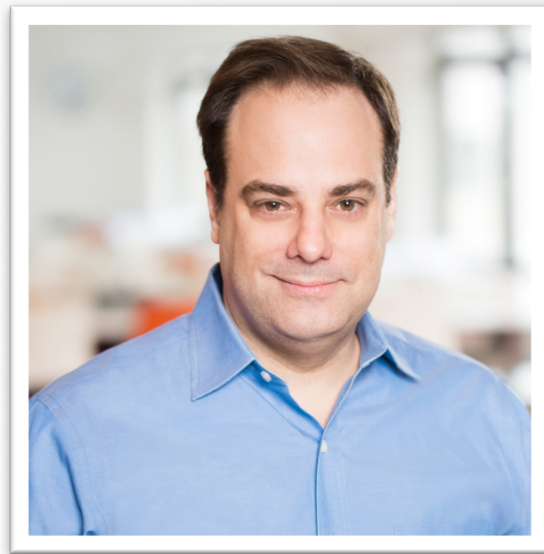
What do I need?

- // Version control system (Git)
- // Application build tool (Maven)
- // Versioning tool (Maven)
- // Code review tool (GitHub)
- // Scripting language (Maven/bash)
- // Artifacts repository (Nexus)
- // Testing environment (Google App Engine)



Joel Spolsky

Avram Joel Spolsky (born 1965) is a software engineer and writer. He is the author of Joel on Software, a blog on software development, and the creator of the project management software Trello.[2] He was a Program Manager on the Microsoft Excel team between 1991 and 1994. He later founded Fog Creek Software in 2000 and launched the Joel on Software blog. In 2008, he launched the Stack Overflow programmer Q&A site in collaboration with Jeff Atwood. Using the Stack Exchange software product which powers Stack Overflow, the Stack Exchange Network now hosts over 170 Q&A sites.



Joel Spolsky Test

- 01. Do you use source control?**
- 02. Can you make a build in one step?**
- 03. Do you have daily builds?**
- 04. Do you have a bug database?**
- 05. Do you fix bugs before writing new code?**
- 06. Do you have an up-to-date schedule?**
- 07. Do you have a spec?**
- 08. Do programmers have quiet working conditions?**
- 09. Do you use the best tools money can buy?***
- 10. Do you have testers?**
- 11. Do new candidates write code during their interview?**
- 12. Do you do hallway usability tests?**



Overall benefits

- // Speed of delivering new features
- // Higher quality
- // Better application architecture
- // Product more aligned with the vision
- // Flexibility in working on single feature by more than one developer
- // Easy QA process
- // Easy production bugs investigation



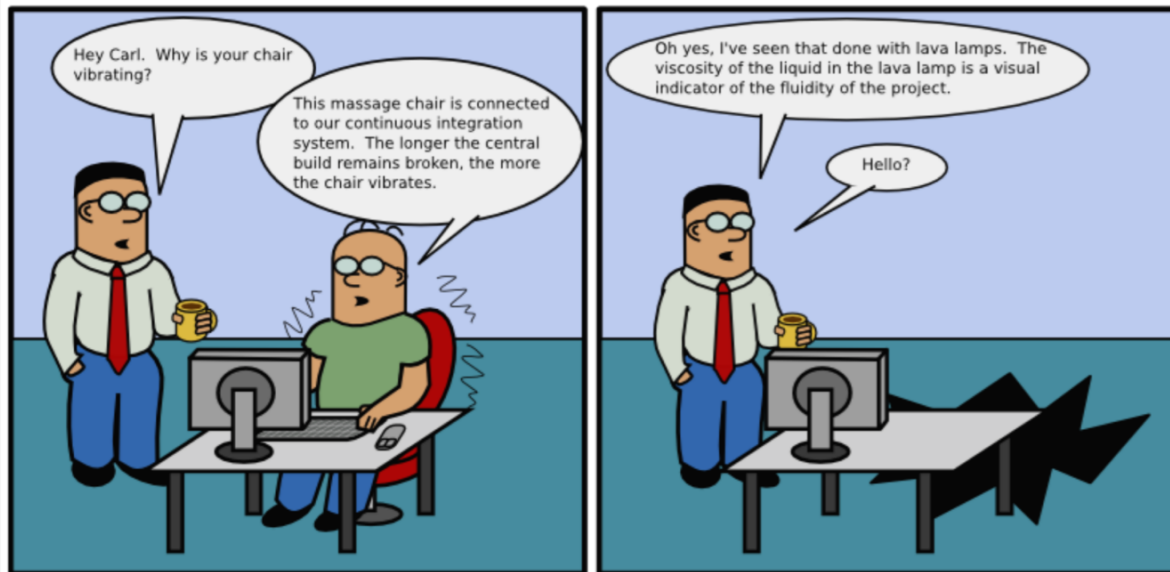


What's next?

- // Continuous Deployment / Delivery (CD)
- // Microservices pattern
- // Nightly Builds
- // Automated Integration/Functional/... tests
- // A/B testing
- // ...



Digression



CarlAndSteve.com





Cloud Corridor
GUIDING BUSINESSES TO THE CLOUD

Contact

<http://www.dragonia.org.pl>