



hammer.io

**A tool for developing, maintaining, and monitoring
Node.js microservices.**

Tyr In Production:

<https://www.npmjs.com/package/tyr-cli>

Source Code:

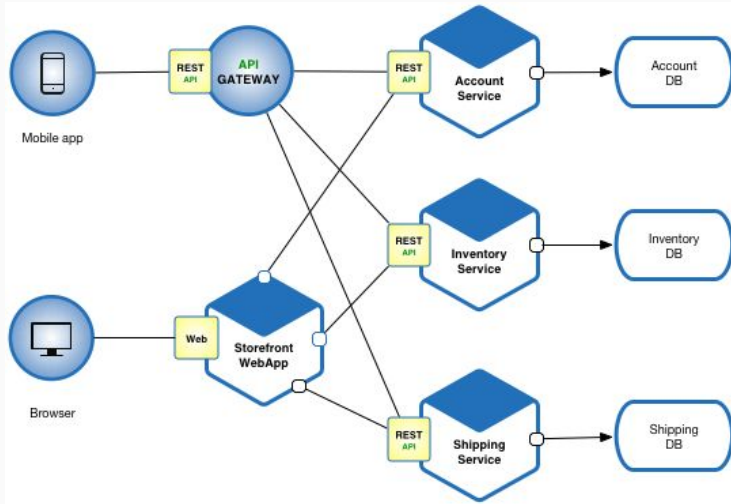
<https://github.com/hammer-io>

Website

<https://hammer-io.github.io>

**Erica Clark, Nathan De Graaf, Nathan Karasch, Jack Meyer, Nischay Venkatram
Lotfi ben-Othmane**

What are microservices?



“Microservices . . . is an architectural style that structures an application as a collection of loosely coupled services, which implement business capabilities. The microservice architecture enables the continuous delivery/deployment of large, complex applications.”

<http://microservices.io/>

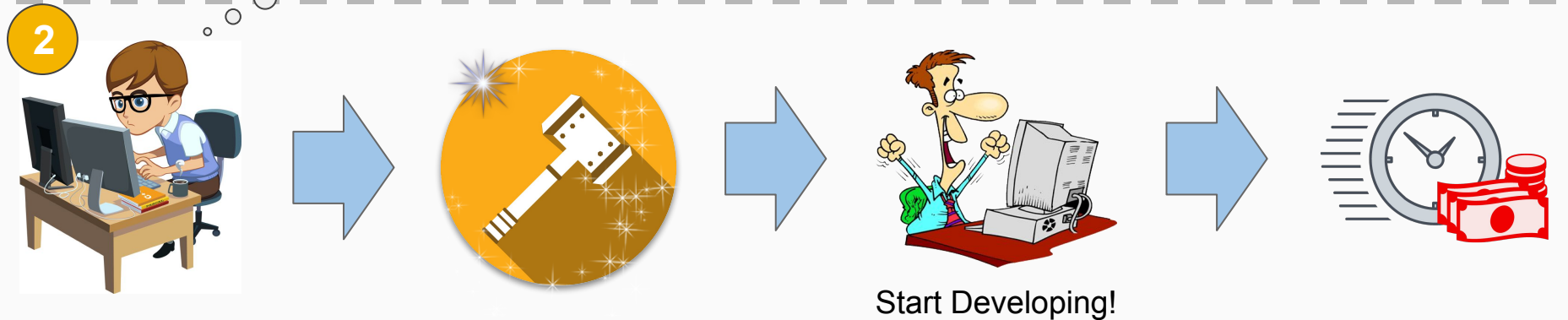
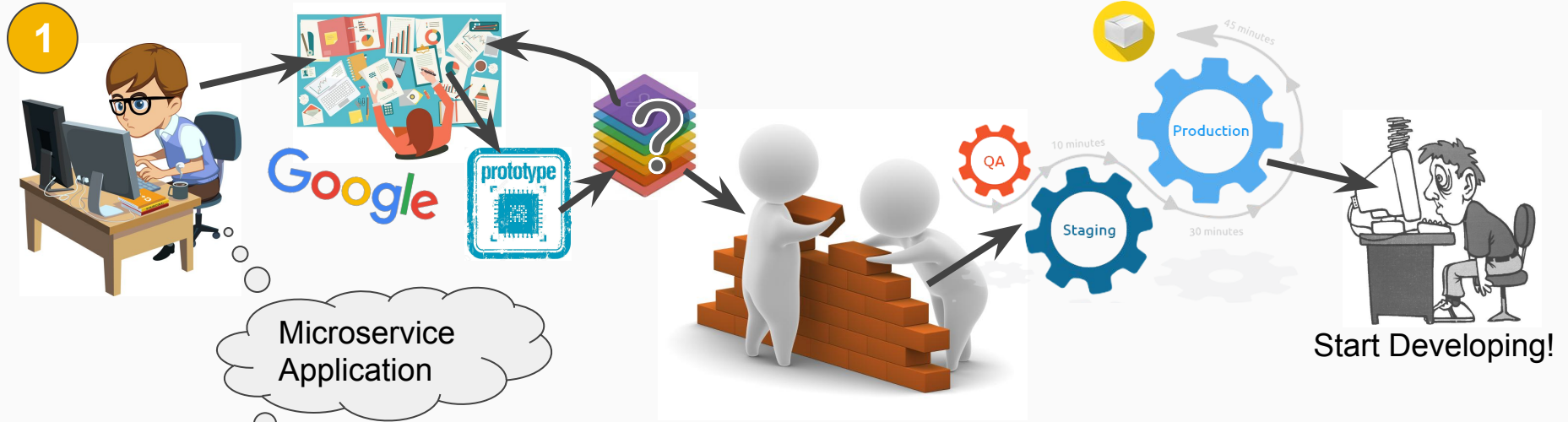
http://microservices.io/i/Microservice_Architecture.png

What's the problem?



- In order to deploy a set of microservices to the cloud reliably, a developer must go through a significant amount of work to establish the infrastructure and build an automated deployment process.
- Students or small startups with limited knowledge, resources, or time are faced with a significant barrier when beginning a microservices project.

The Tale of Two Coders





Tyr

An automated DevOps process for Node.js applications

+



Heimdall

A framework to develop Node.js microservice applications

+



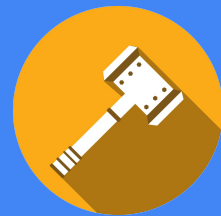
Yggdrasil

An interface to monitor the health and status of deployed Tyr applications

Functional Requirements



- The product shall generate an opinionated Node.js project, ready for Microservice development
- The product shall set up an automated DevOps workflow, which can be customized by the user
- The product shall allow the user to view statistics, reports, and analytics about their deployed applications
- The product shall have a library that allows data such as health statuses, data flow statistics, and other application information to be gathered and sent to a web application to be viewed
- The product shall allow the user to add new microservices into an existing microservice architecture



Non-functional Requirements

- Usability
 - A clean, consistent look and feel throughout the product, which is usable by those with limited understanding of DevOps and services being utilized
- Supportability
 - The system will support Node.js version 8.x> on Unix-based systems
- Reliability
 - Reliable uptime for web application
- Security
 - Secure handling of user information

What else is out there?



SPRING INITIALIZR bootstrap your application now

Generate a with and Spring Boot

Project Metadata

Artifact coordinates

Group

Artifact

Name

Description

Dependencies

Add Spring Boot Starters and dependencies to your application

Search for dependencies

Selected Dependencies

- Web
- De

IBM Bluemix

Spring Boot

The screenshot shows the IBM Bluemix dashboard for an application named 'my-ti-app'. The top navigation bar includes 'DASHBOARD', 'SOLUTIONS', 'CATALOG', 'PRICING', 'DOCS', 'COMMUNITY', and 'REGION: US South'. The application status is 'my-ti-app' with routes 'my-ti-app.mybluemix.net'. Key metrics include 1 instance, 512 MB memory quota, and 768.0 MB available memory. The 'APP HEALTH' section shows 'Your app is running.' with 'RESTART' and 'STOP' buttons. The 'ACTIVITY LOG' shows a sequence of events: started, stopped, started, stopped, and started. Below the activity log, there are buttons to 'ADD A SERVICE OR API' and 'BIND A SERVICE OR API'. At the bottom, there are service cards for 'Internet of Things' and 'Cloudant NoSQL DB'.

Potential Risks & Mitigation



- Integration with Third Party APIs
 - We are using many third party APIs, which can change, often times without notice
 - We run integration tests daily to ensure that we are aware if the API changes and it breaks our code
- Security risks
 - We are handling user data and passwords, sometimes of third party services
 - We follow best practices and consult with Dr. ben-Othmane
- Sustainability
 - We will be leaving, so someone else must understand code base
 - We practice code reviews and constant vigilance



How much does this cost?

- \$0.00
- Open Source Tooling and Iowa State Resources keep costs at zero

Project Milestones & Schedule



Aug				Sept				Oct				Nov				Dec			
W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
		Requirements gathering																	
				Research															
						Build CLI tool for app generation													
												Web app setup							
																Demos			

Jan				Feb				Mar				Apr					
W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4		
Monitoring Web application																	
				Deployment Web application													
										Development framework							
										Testing, Validation, Polishing							

Demo



Last login: Mon Dec 4 22:38:10 on ttys001

Ericas-MacBook-Pro:~ enclark\$ cd Demo

Ericas-MacBook-Pro:Demo enclark\$ tyr

tyr

? Project Name: [tyrdemo](#)

? Project Description: [A demo to show off tyr!](#)

? Version: [0.0.0](#)

? Author: [Erica Clark](#)

? License: [MIT](#)

? Choose your source control tool: [GitHub](#)

? Choose your CI tool: [TravisCI](#)

? Choose your containerization tool: [Docker](#)

? Choose your hosting service: [Heroku](#)

? Choose your web application framework: [ExpressJS](#)

Please login to [GitHub](#):

? GitHub Username: [enclark](#)

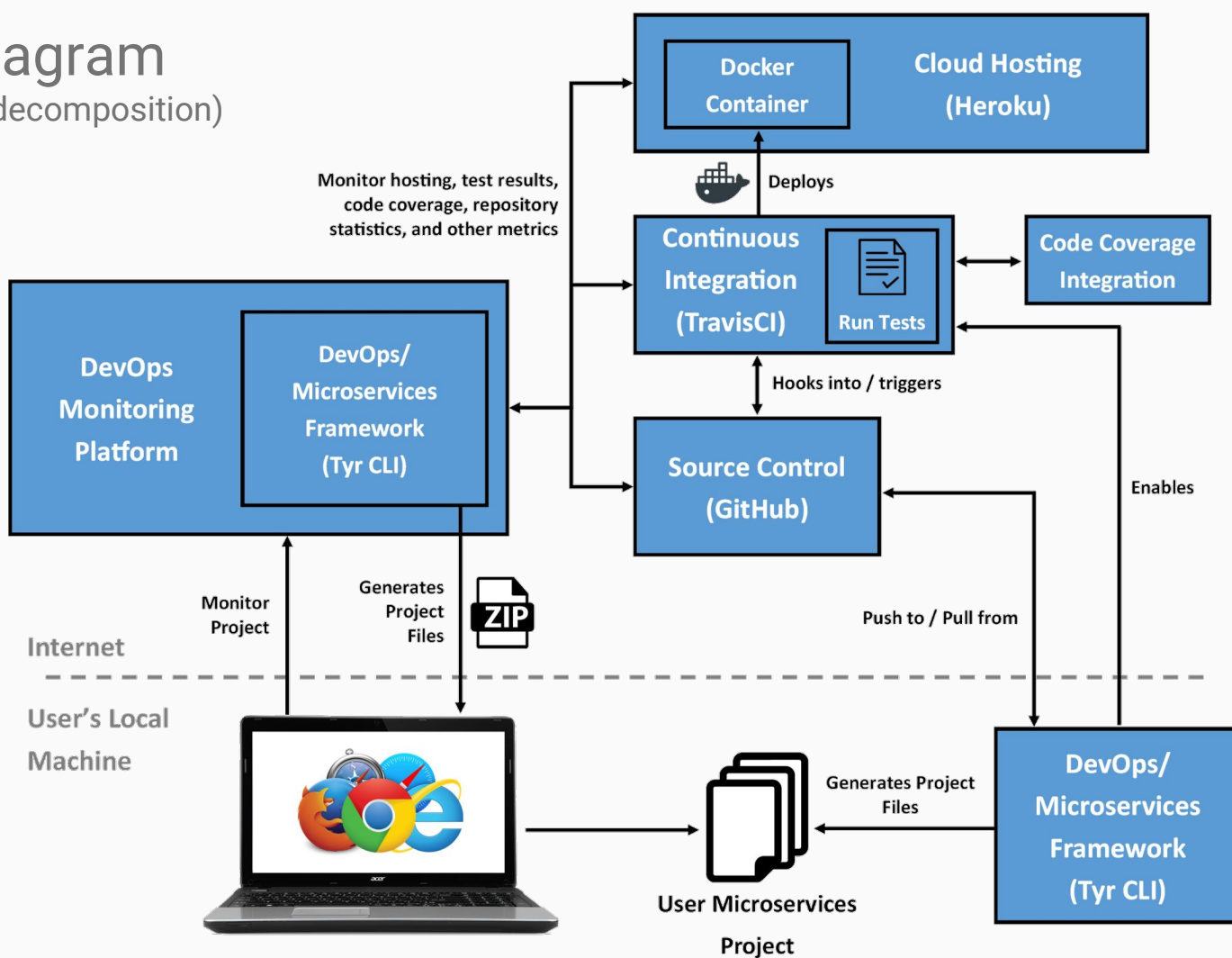
? GitHub Password: [*****](#)

System Design



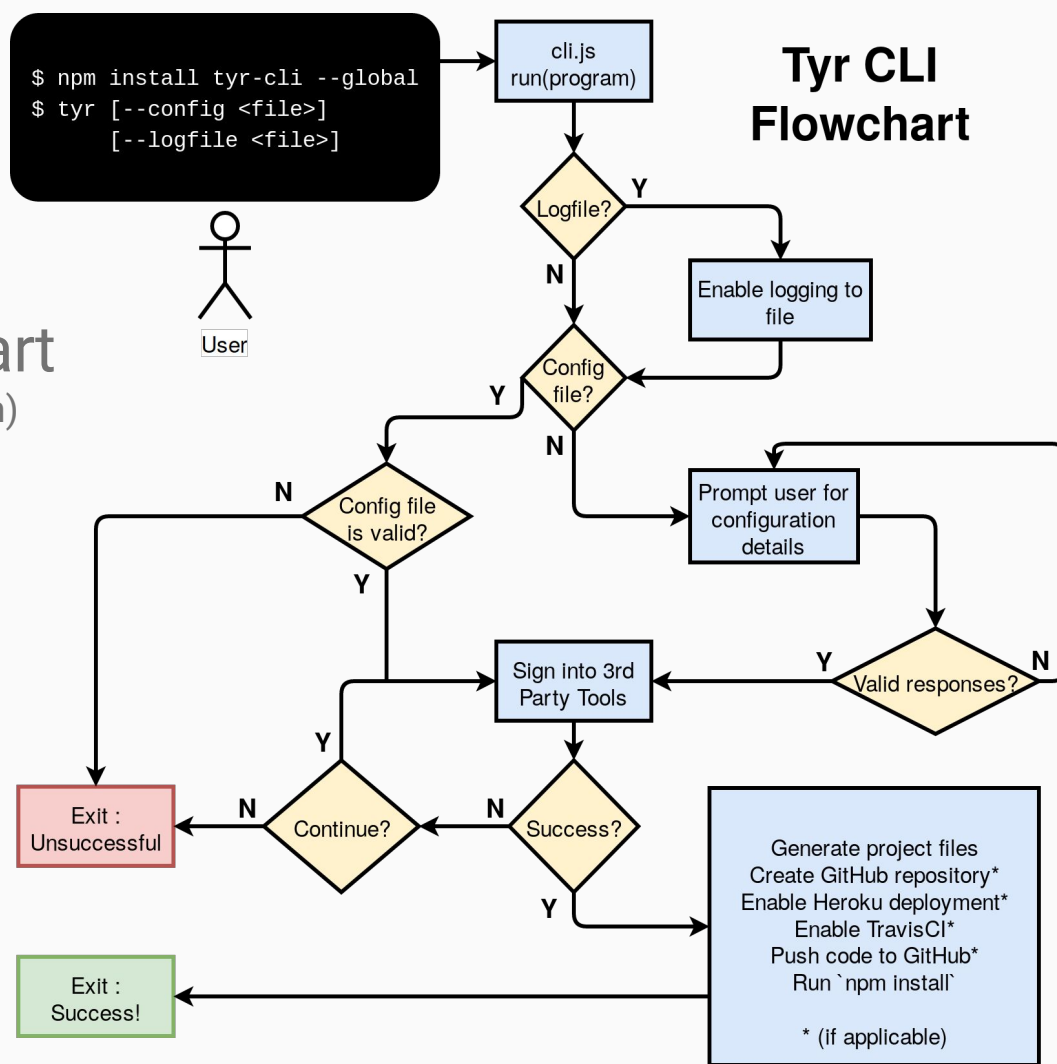
Block Diagram

(a functional decomposition)



Tyr CLI Flowchart

(a functional decomposition)



Tyr CLI Flowchart

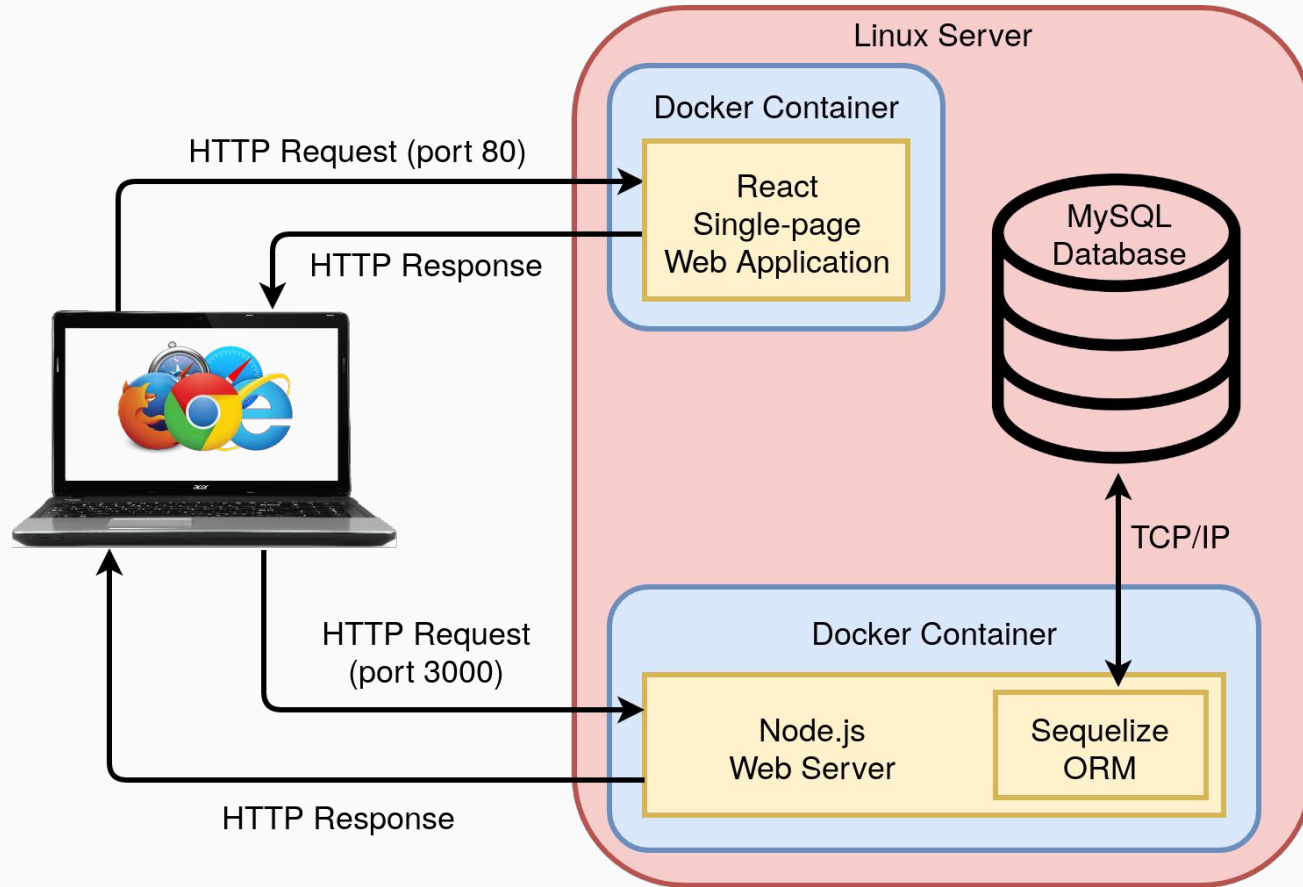
```
$ npm install tyr-cli --global
$ tyr [--config <file>]
    [--logfile <file>]
```



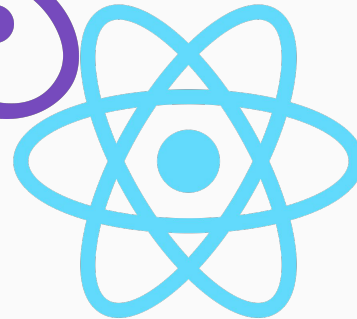
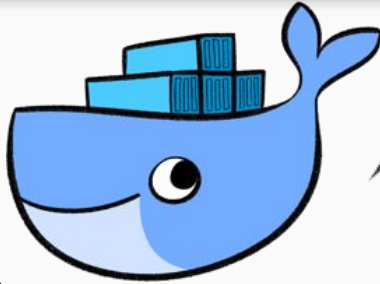
Exit : Unsuccessful

Exit : Success!

Generate project files
Create GitHub repository*
Enable Heroku deployment*
Enable TravisCI*
Push code to GitHub*
Run `npm install`
* (if applicable)



Technologies used



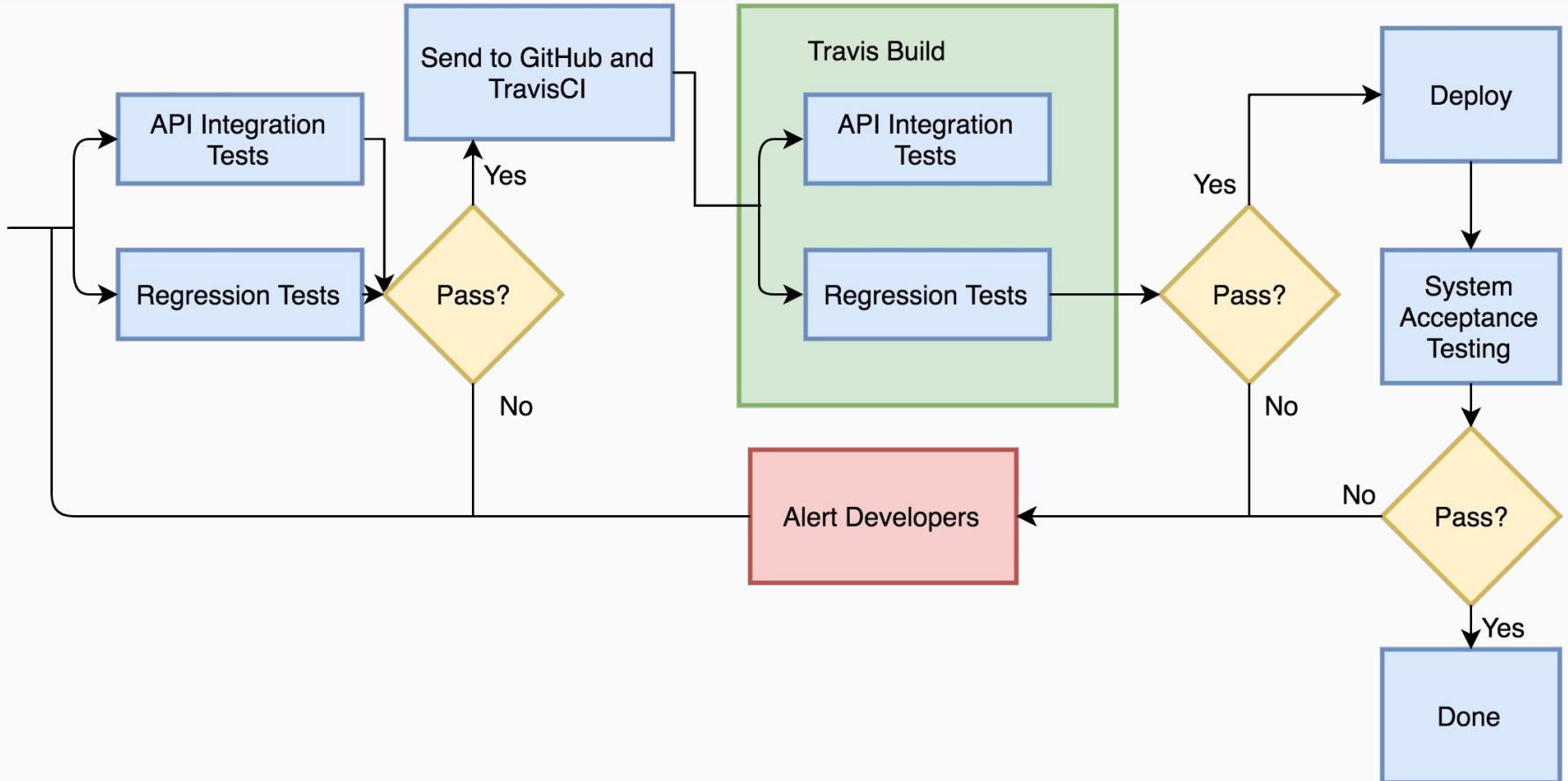
How are we testing it?



- Unit Testing with Mocha
- Integration Test Suite with Mocha
- TravisCI for Continuous Integration
- Manual Testing for System Testing and Acceptance Testing



Test Plan



Closing Material



Where are we?



We published version 0.1.4 of Tyr, our CLI tool

Setup is complete and development has started on our web app Yggdrasil

Aug				Sept				Oct				Nov				Dec			
W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
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hammer.io x Create New Project LOGIN

Home
Login
Register
New Project

Enter some information about your project

Project Name
Project Description
Version
Author
License

Choose which services to integrate into your project

Source control
GitHub
CI tool
TravisCI
Containerization tool
Docker
Hosting service
Heroku



Where are we going?

- Continued Support for Tyr (New Features and Bug Fixes)
- Continued Development for Yggdrasil
- Start developing on monitoring framework

Jan				Feb				Mar				Apr			
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Questions?

The Team



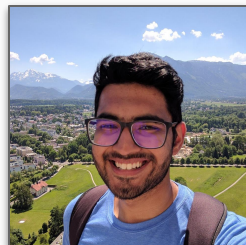
Erica Clark
Data Analytics Lead
Website/Content Management
Yggdrasil Backend Security



Jack Meyer
Communications
Software Architecture
Test Lead



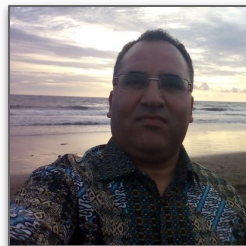
Nathan De Graaf
React Designer
Status Reports
Yggdrasil Frontend Design



Nischay Venkatram
UI Lead
Node.js SME
Yggdrasil Frontend Architecture



Nathan Karasch
Project Management
Technical Writing
Website Design & Maintenance



Dr. Lotfi Ben-Othmane
Client
Faculty Advisor