Hammer-IO

An online platform to build, deploy, and monitor microservice applications in Node.js

Official Website
https://hammer-io.github.io

Take it for a spin!
http://hammer-io-test.ece.iastate.edu

Team

sdmay18-19

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Advisor / Client

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Problem

The development and deployment of microservice applications to the cloud is a complex process that requires significant resources and domain expertise. Students and small startups with limited knowledge, resources, or time are faced with a significant barrier when beginning a microservice application.

Solution

Hammer-IO provides an online platform to build, deploy, and monitor microservice applications in Node.js.

Users

- Small Teams
- Startups
- Students
- Developers with limited time & resources

Usages

Initialize the DevOps Pipeline

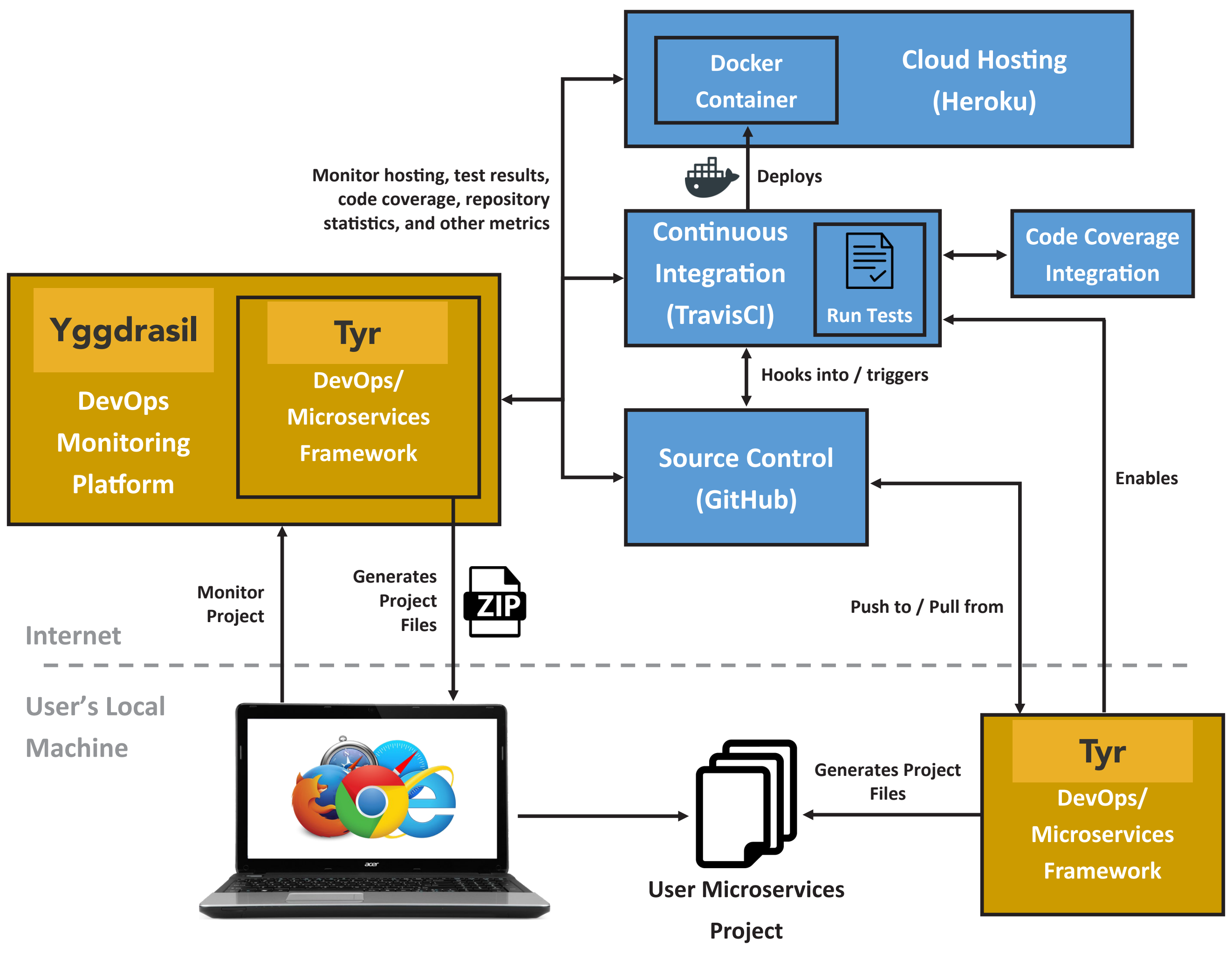
- Source Control
- Continuous Integration
- Testing
- Containerization
- Deployment

Application Monitoring

- Application Uptime
- Memory Consumption
- Server Response Time & Server Status
- URL Usage
- Issues
- Build Statuses

Components

Tyr	A Node.Js application generator with automated DevOps initialization
Yggdrasil	A web interface to monitor the health and status of deployed Tyr applications
Endor	The backend server
Koma	A microservice to collect and aggregate monitoring data sent by user applications
Skadi	A Node.Js module acting as middleware in an Express application to stream monitoring data to Koma



Docker Container
Cloud Hosting (Heroku)
Deploys
Monitor hosting, test results, code coverage, repository statistics, and other metrics
Continuous Integration (TravisCI)
Run Tests
Code Coverage Integration
Hooks into / triggers
Yggdrasil
DevOps Monitoring Platform
Tyr
DevOps/ Microservices Framework
Source Control (GitHub)
Enables
Monitor Project
Generates Project Files
ZIP
Push to / Pull from
Internet
User's Local Machine
Generates Project Files
User Microservices Project
Tyr
DevOps/ Microservices Framework

Testing

Strategy

Write unit and integration tests for new features where possible. Where not possible, use manual testing. Tests and linting run in TravisCI upon push to GitHub. Code must pass review, pass lint, and pass tests before being merged.

Verification Activities

Unit Testing
Individual components tested using Mocha

Acceptance Testing
Developers ensured all features aligned with client requirements

Code Review
Code written in feature branches and reviewed by another dev before merging to master

Integration Testing
Components tested after integration using Mocha and Chai

Manual Testing
Required for most UI features and third-party integration testing

Static Analysis
ESLint used for static analysis. Extended linting rules used by Airbnb.

Project Goals

(Design Requirements)

Functional Requirements

Node.js Application Generation with Fully-Configured DevOps Pipeline

A tool that sets up the services (such as source control, continuous integration, and deployment) involved in maintaining and delivering our user's Node.js application.

Monitoring Interface

A way to view build and test histories, uptime and health statistics, and other reports for one of our user's applications.

Non-Functional Reqs

Usability

Simple, polished, and easy to use.

Supportability

Deployed instance support for Linux with Node.js 8. Web application is cross-platform.

Reliability

Application uptime > 99%

Security

Ensure user passwords and keys are handled safely.

Operational Environment

Automated DevOps Tools

Our tools are published to npm, which can be installed and ran on our user's machines.

Server Instances

Developed cross-platform. Deployed on an Ubuntu 16.04 virtual machine on ISU's VPN.

Source code

GitHub, as an open source project, which allows users to build our project from source.

Technical Details

Programming Languages

All Applications	Javascript

Libraries

Frontend	React
Backend	Node.js, Express.js
Database	MySQL, Sequelize ORM, Firebase

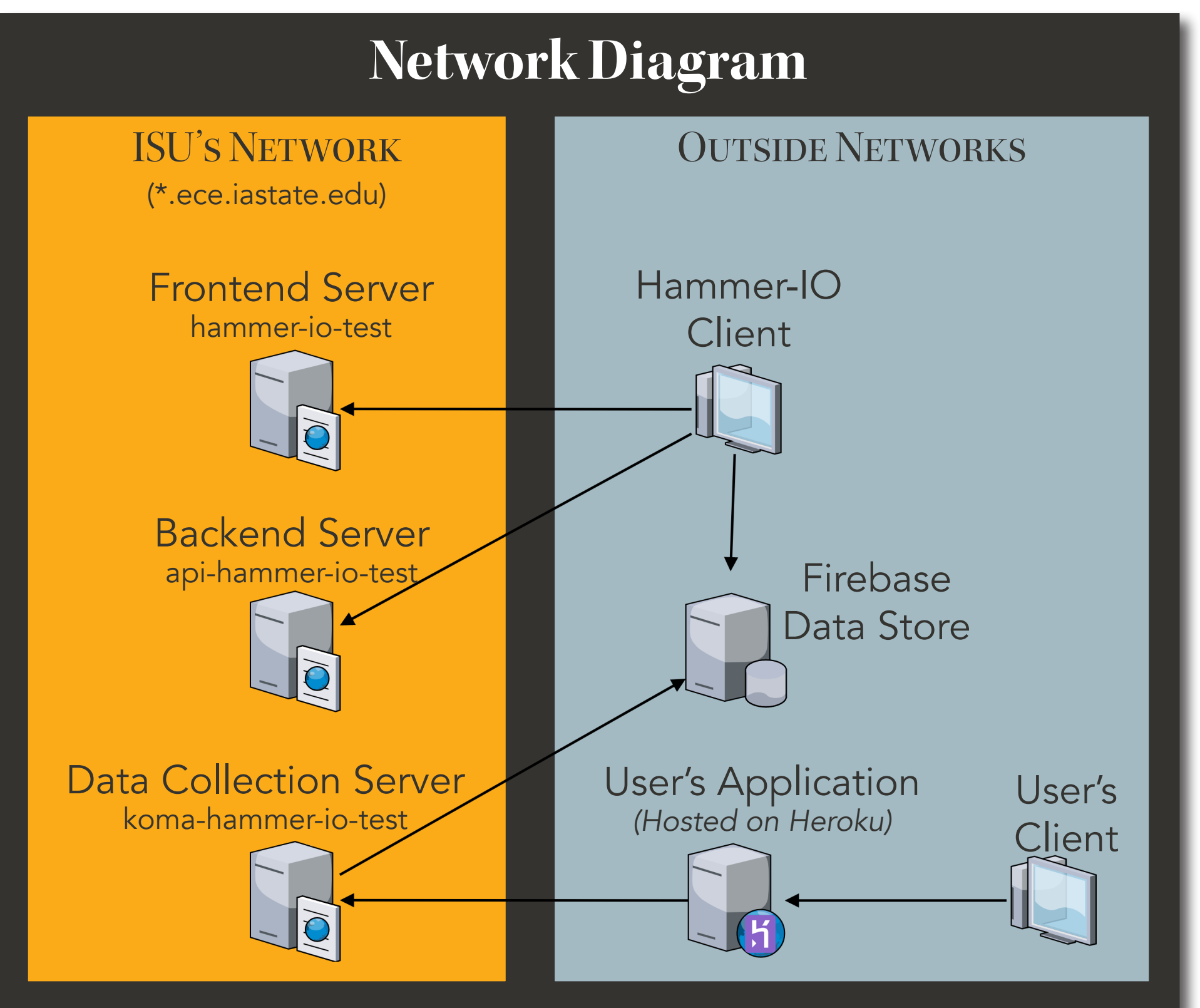
Development Tools

IDEs	IntelliJ, WebStorm, DataGrip
Source Control	Git / GitHub
Project Management	GitHub
Continuous Integration	TravisCI
Deployment	Docker
Dependency Mngmt	NPM

Operating Environment

Endor, Yggdrasil, Koma	Docker containers within a single virtual machine on ISU's VPN. An NGINX reverse proxy routes requests to the appropriate container.
Tyr	CLI installed via NPM.
Skadi	NPM module used as a dependency in a user's Node application.

Network Diagram

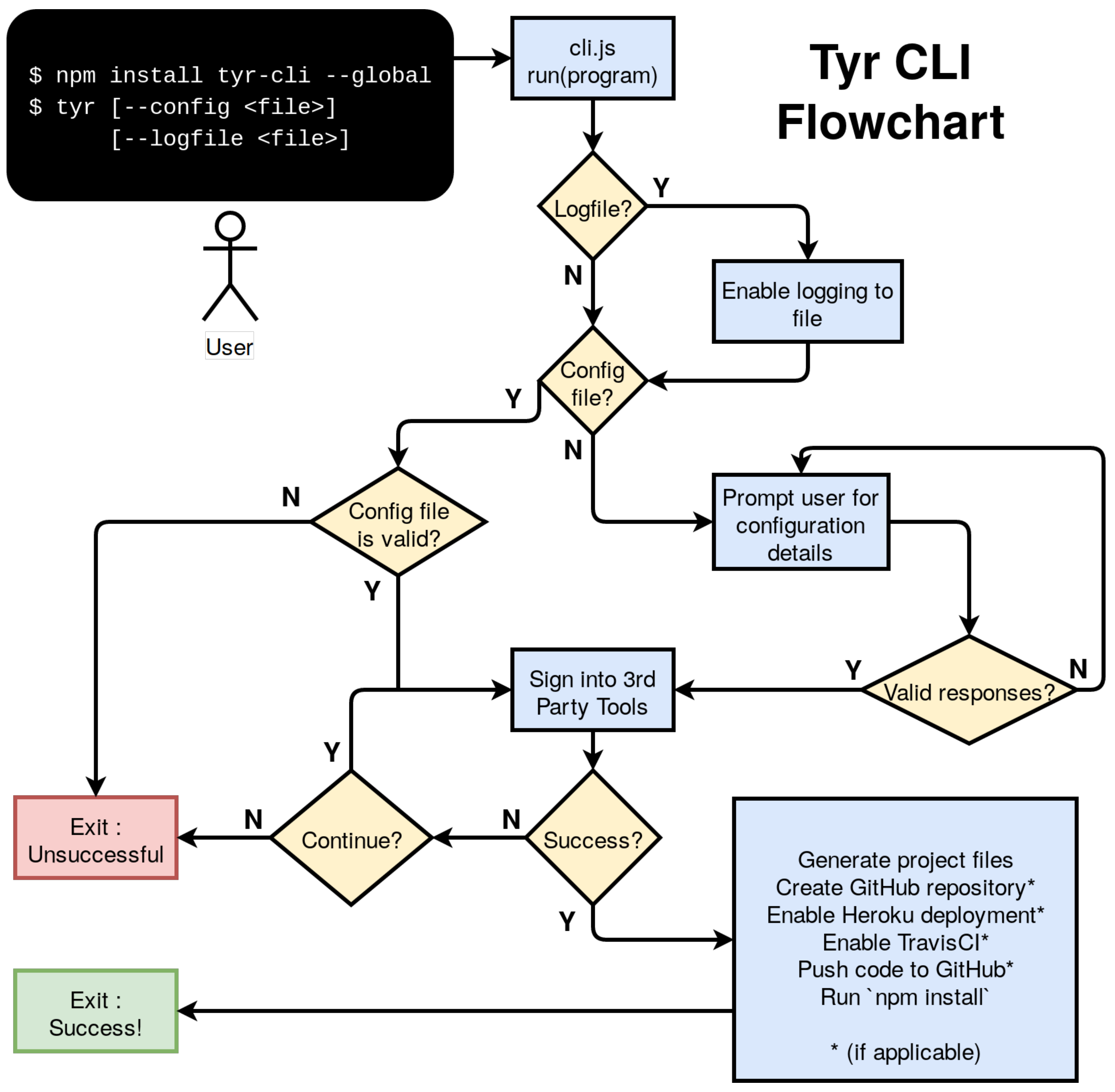


By the Numbers

(as of 4/20/2018)

Developers:	5
Systems:	6
Issues Opened:	360
Issues Closed:	313
Git Commits:	926
Lines of Code for Tracked Files:	189,608

Tyr CLI Flowchart



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