Hyperledger Caliper Visualization
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Jason You

Hyperledger Caliper Visualization

- Introduction

  - **Name:** Jason You
  - **Location:** United States, West Lafayette
  - **University:** Purdue University
  - **Mentors:** Attila Klenik, Feihu Jiang
  - **Hyperledger project:** Hyperledger Caliper Visualization

Hyperledger Caliper Visualization

Project Description

Overview & Goals

1. Building a GUI (Graphical User Interface) with two main functionalities:
2. Generating customizable **configuration files** for Caliper and Hyperledger Blockchains.
3. Visualizing main benchmarks from Caliper in real time: *e.g.* ***latencies and throughputs***.

Technologies/Tools/Frameworks

1. MERN Stack for GUI (**React**), API (Application Programming Interface), DB (**MongoDB**), and data processing Server (**Node** & **Express**) implementations.
2. **Chart.js** and **Plotly.js** for visualizations.
3. **Socket.io** for real-time data transmission
4. Different versions of Fabric and Sawtooth **configuration files**, and their architectures.

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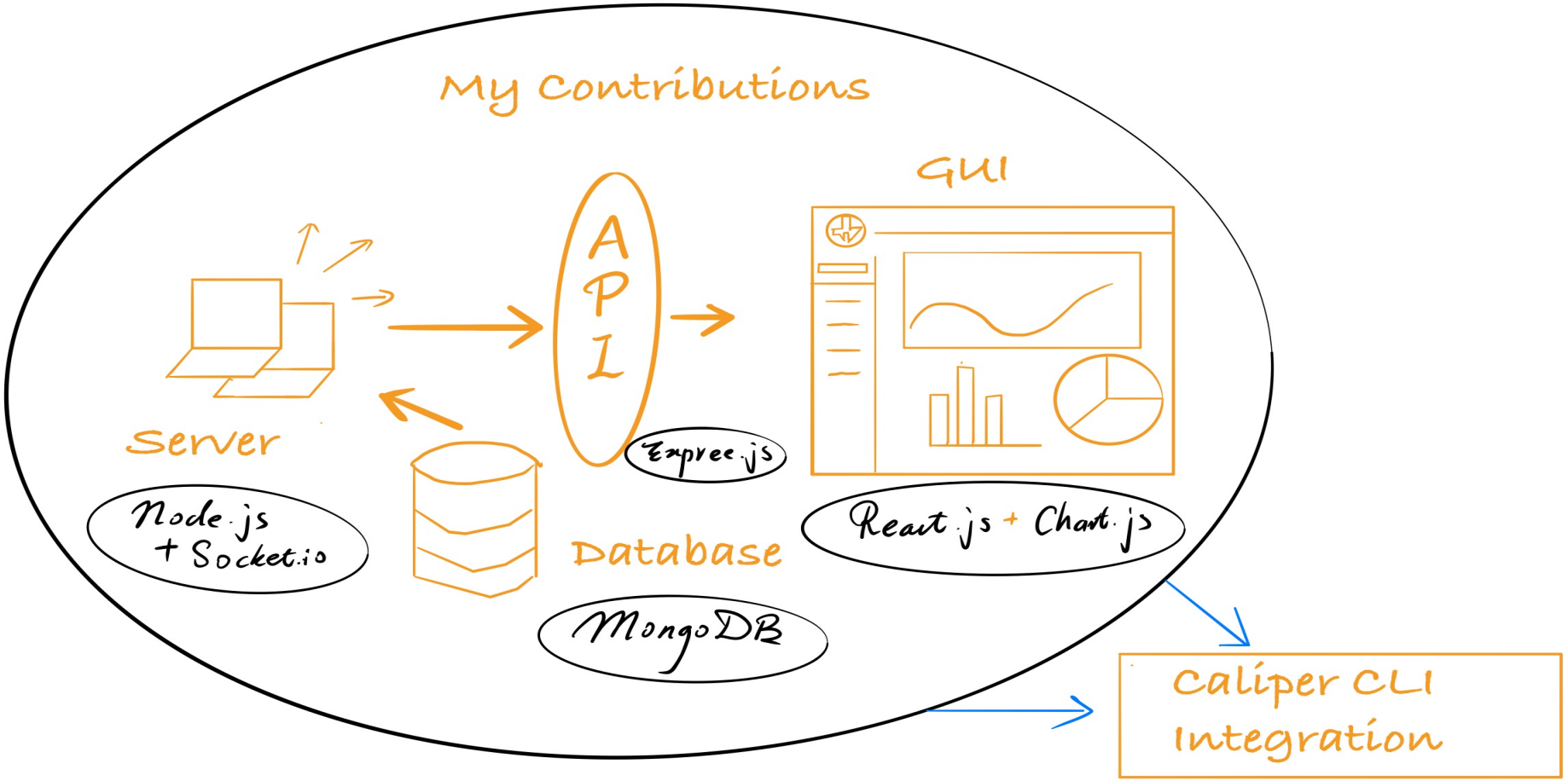
- Project Structure (My Contributions)



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- Project Objectives
  - **Obj 1:** Building GUI that integrates with Caliper-CLI from scratch.
  - **Obj 2:** Generating configuration files for major Hyperledger frameworks: Fabric, Sawtooth, Burrow, Iroha, etc.
  - **Obj 3:** Building real time benchmark data visualizations based on Caliper-CLI testing results.

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- Project Deliverables
  - **Deliverable 1: Caliper-GUI** (NPM package, or make it a Docker container)
  - **Deliverable 2: Documentation** for the GUI configuration
  - **Deliverable 3: Screen cast** to help Caliper user to learn the GUI.

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Project Execution & Accomplishments

Completed

- The GUI application and the documentations for its usage.
- Real time visualizations and configuration file generating functionalities.

Remaining Tasks

- User friendly installation scripts for users to run/connect the Caliper-GUI with Blockchain.
- **Resource utilization visualizations** (now only the benchmarks).
- **One-click button** to connect/disconnect the Caliper-GUI with the Blockchain Server.

Most Proud Of

- Completing a full stack project **from scratch**, and **learned lots of new tools** by doing.
- Integrating **a new component into a large project**, and solved a few configuration issues.
- **Confidence** to develop **Blockchain apps** with new technologies acquired.

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- Recommendations for future work

- Improvements
- Automating the configuration between the Caliper-GUI and -CLI, so that it can be used like Truffle Ganache (TestRPC) for the Ethereum Blockchain.
- Cloud service supporting for updating and querying benchmark history of Caliper.

- Extensions
- Supporting **more frameworks**: currently we are only focusing on Fabric and Sawtooth.
- Adding more visualization options.
- Completing the **real-time Blockchain network topology** graph visualization.

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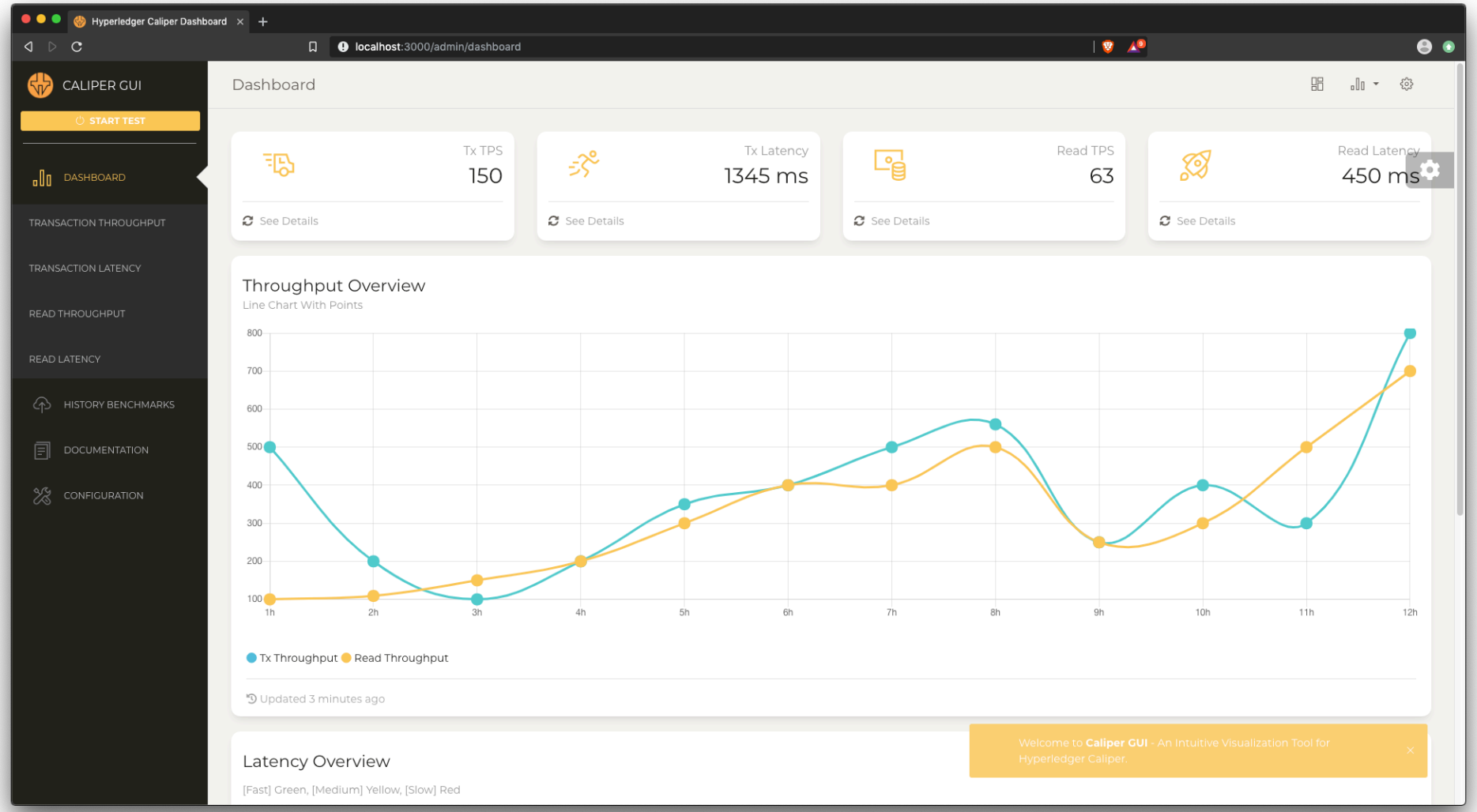

- GUI Design
- Benchmark Overviews
- Read & Tx. Throughput Visualization
- Sidebar: More details

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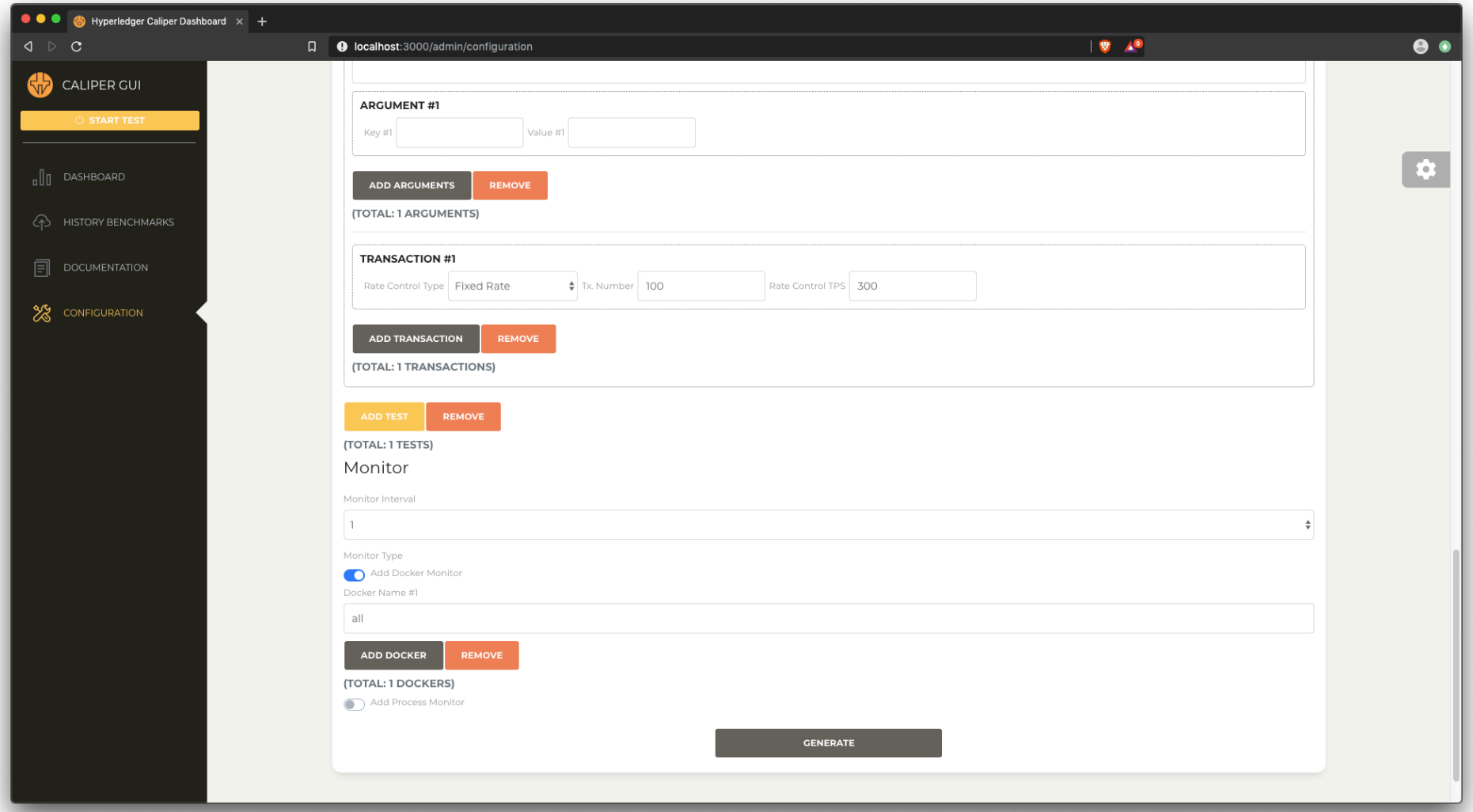

- **GUI Design**
- Test Generator
- User Friendly
- Fast Generation

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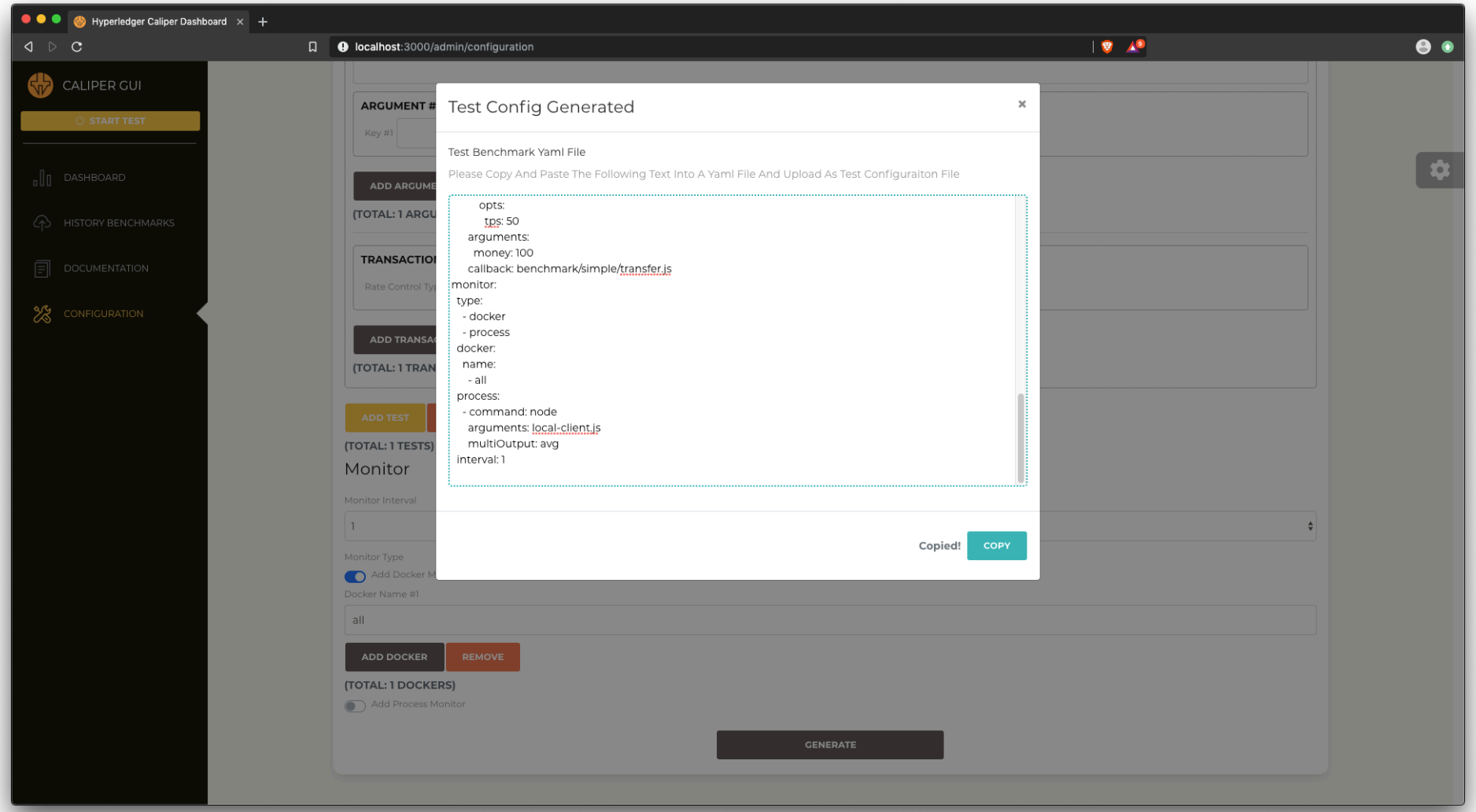

- GUI Design
- Editable Output
- One-click Copy
- Direct Usage

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- **References**

- Sample GUI Link (Not the full version)

  - URL: http://zstarter.tech:3000
  - My Contact Info: jason.shengwey@gmail.com