

Hyperledger Umbra: (Si)Emulating Hyperledger Blockchains using Mininet November, 2019

Hyperledger Umbra: Simulating Hyperledger Blockchains using Mininet

› Introduction

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- › **Mentor(s):** David Huseby
- › **Hyperledger project:** Umbra Lab

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- › **Project Description:** The simulation research internship during the summer of 2018 led to the creation of the Hyperledger Umbra Lab. Due to the overall difficulty of getting Hyperledger blockchain frameworks running under the Shadow simulation tool, work on the Umbra lab has slowed to a crawl. A different network simulation tool called Mininet has been proposed as an alternative to using Shadow and it has the potential to drastically reduce the startup cost of getting a network simulation tool running Hyperledger blockchains. This proposal is for a research project to test the feasibility of running Hyperledger blockchains under Mininet for the purposes of running scalability and consensus mechanism experiments.

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› Project Objectives:

- › Obj 1: Build reference architecture (Logical View and Process View)
- › Obj 2: Evaluate Fabric project with reference architecture
- › Obj 3: Build Stimulus, Monitoring, Dynamics
- › Obj 4: Build Analysis
- › Obj 5: Extend architecture to other Hyperledger project(s)
- › Obj 6: Document the project

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› Project Deliverables:

- › Deliverable 1: Generic platform for running Hyperledger Blockchain Projects
- › Deliverable 2: Reproducible Ad-hoc HL-Fabric Network (main achievement)
- › Deliverable 3: Reproducible Ad-hoc HL-Iroha Network (almost finished)
- › Deliverable 4: Documentation (ongoing)
- › Deliverable 5: Application for Hyperledger Global Forum

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- › **Project Execution & Accomplishments:** The design of a generic platform event-oriented that can be modularly extensible to reproduce any Hyperledger Blockchain. Main difficulty was about understanding project Fabric, not well documented. Documentation is still going on, demands mostly how to create an example of extending Umbra for another blockchain project.

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- › **Recommendations for future work:** This is the beginning of reproducible academic work on Hyperledger blockchain projects. I.e., the development of comparable methodologies for consensus, gossip, security, etc. Now, the most interesting work is running Umbra at scale, a cloud with hundreds/thousands of blockchain nodes.

Many Thanks to the Hyperledger Internship Community!

#umbra via labs@lists.hyperledger.org
<https://github.com/hyperledger-labs/umbra>