Hyperledger Mentorship Project Presentation

August 2020
Create Kubernetes Operator for Hyperledger Besu

Introduction

- **Name:** Sumaid
- **Location:** Hyderabad, India
- **University:** International Institute of Information Technology, Hyderabad
- **Mentor(s):** Mark Wagner, Joshua Fernandes
- **Hyperledger Project:** Hyperledger Besu
Create Kubernetes Operator for Hyperledger Besu

**Problem:**

Deploying applications using plain docker has many issues such as:

1. No management layer on top of it
   - If a container dies, nothing will restart it
   - If a virtual machine crashes, no failure recovery
2. No monitoring, alerts, etc
3. Not scalable, no easy way of spreading containers among VMs

**Solution:** Kubernetes Operator!
Create Kubernetes Operator for Hyperledger Besu

Project Objectives & planned timeline:

- Weeks 1-2: Making overall design of the project, reading documentations of Hyperledger Besu, operator-sdk framework
- Weeks 3-4: Phase 1 of operator which involved simple installation of Hyperledger Besu
- Weeks 5-6: Adding automated keys generation & handling of different configurations
- Weeks 7-8: Failure recovery, error handling
- Weeks 9-10: Version upgrade
- Final Weeks: Creating hyperledger lab, documentation, thorough testing
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› Project Deliverables:
  › Besu Operator: Operator code being developed as part of Hyperledger Lab
  › Documentation: Well documented operator code
  › User Guide: Guide to provide instructions for both developer and user

› Features:
  › Prepared, automated installation of Hyperledger Besu
  › Users can decide number of validators, bootnodes, member nodes, image information, ports, etc
  › Keys generation & genesis json generation is entirely done within Go framework.
  › Monitoring through Grafana & Prometheus
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Project Execution & Accomplishments:

› Implemented most of the requirements of the project.

› Proper research & design in the initial weeks helped make future path crystal clear.

› Proudest moment was first time operator installing Hyperledger Besu properly.

› Always tried to stay 1-2 weeks ahead of the schedule.

› Weekly discussion with mentors regarding the project progress.
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Recommendations for future work:

- Test operator on a redhat or some other environment.
- Add features to support version upgrade of other attributes (other than image & number of replicas).
- Provide a contribution guide for newcomers to start contributing to this and also to create similar operators for other projects.
- Extend operator structure to other types of Besu networks.
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› Project Output or Results:

› Project Description & Plan : [Link](#)
› Project Wiki Page : [Link](#)
› Project Code (Hyperledger Lab) : [Link](#)
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Insights Gained:

- Nothing as exciting as getting first PR merged!
- Open source is a wonderful community which is all inclusive, people from different countries belonging to different cultures working together is truly amazing!

Tips:

- Don't hesitate to ask questions, people are very helpful, they want to help you
- Initially it may seem daunting, but once you start reading documentation, talking to people on irc, things will become easier.
THANK YOU!