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

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› **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 !

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› **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.

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THANK YOU!