Dataverse Scaling: Sprint 4 Demo

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Reminder of Project Goals & Scope

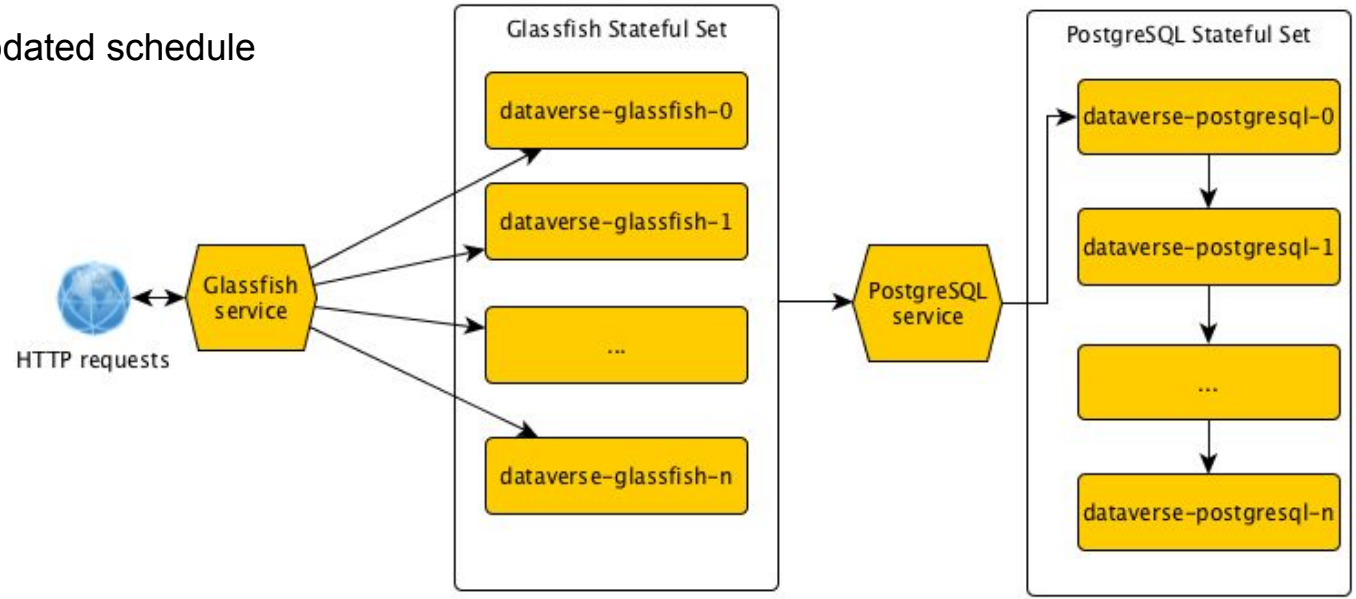
- Dataverse was developed as an N-tier web app
  - 1 HTTP server - Glassfish
  - 1 Database - Postgres
  - 1 Search Indexer - Solr

- Collaboration w/ Red Hat moved these components to Docker images

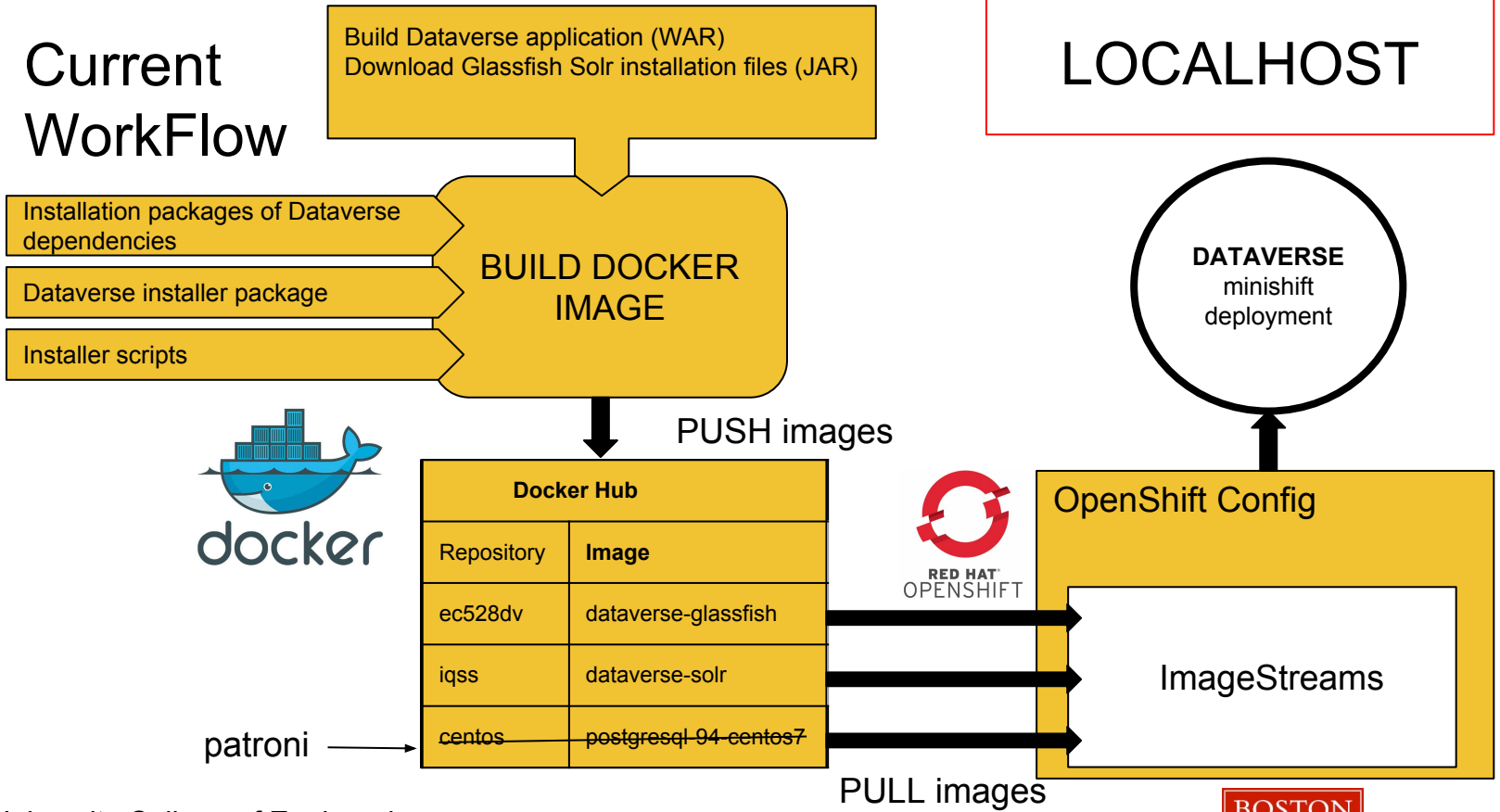
- Our project is to continue this work and create a configuration where Dataverse can scale these components on OpenShift

System overview

- Updated schedule



Current WorkFlow



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Work completed

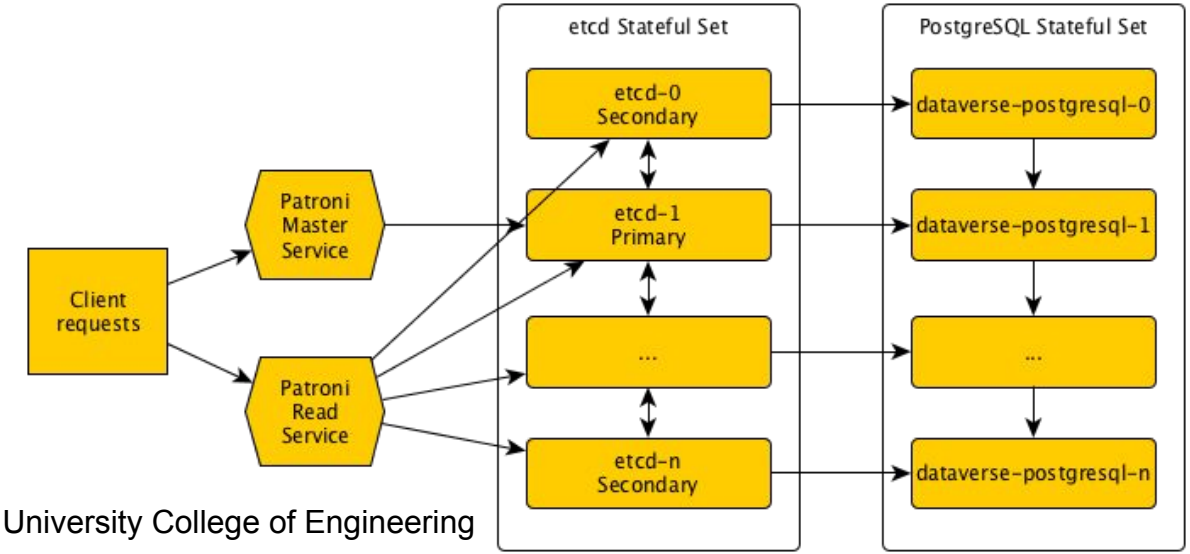
- Bash script for automating building, pushing and deploying docker images from docker hub if not available locally.
- Switched Centos postgres image with patroni and connected it with glassfish locally.
- Created MOC accounts.
- Deployed Dataverse to MOC's Openshift Container Platform.

Postgres DB: Switching from Centos to Patroni

- Dataverse was originally setup to use the default Centos Postgres image
- This image would need to be configured for replication when scaling the number of instances
- The Patroni Postgres image is already configured for high-availability on Kubernetes (but not OpenShift, more on this later)

Patroni Postgres Image

Patroni uses etcd key-value store for metadata (e.g. pod is primary/secondary)
The master service always points to the master (in this example, pod 1).
The read service can read from any replica (eventually consistent).



- etcd implements Raft consensus protocol (Ongaro & Ousterhout, 2014)
- Raft is an easier-to-understand version of Paxos (Lamport, 1998)
- Consensus is agreement by agents on values & ordering
- Each pod has timer, when timer expires an election is held for primary
- Primary issues heartbeat notifications which update secondaries and reset their timers
- Allows tolerance of network partitions (e.g. in a 3 node setup with 0 as primary, if 0 is partitioned, 1 and 2 hold election. When 0 comes back online it is brought up to date)

(not fully functional)
DEMO

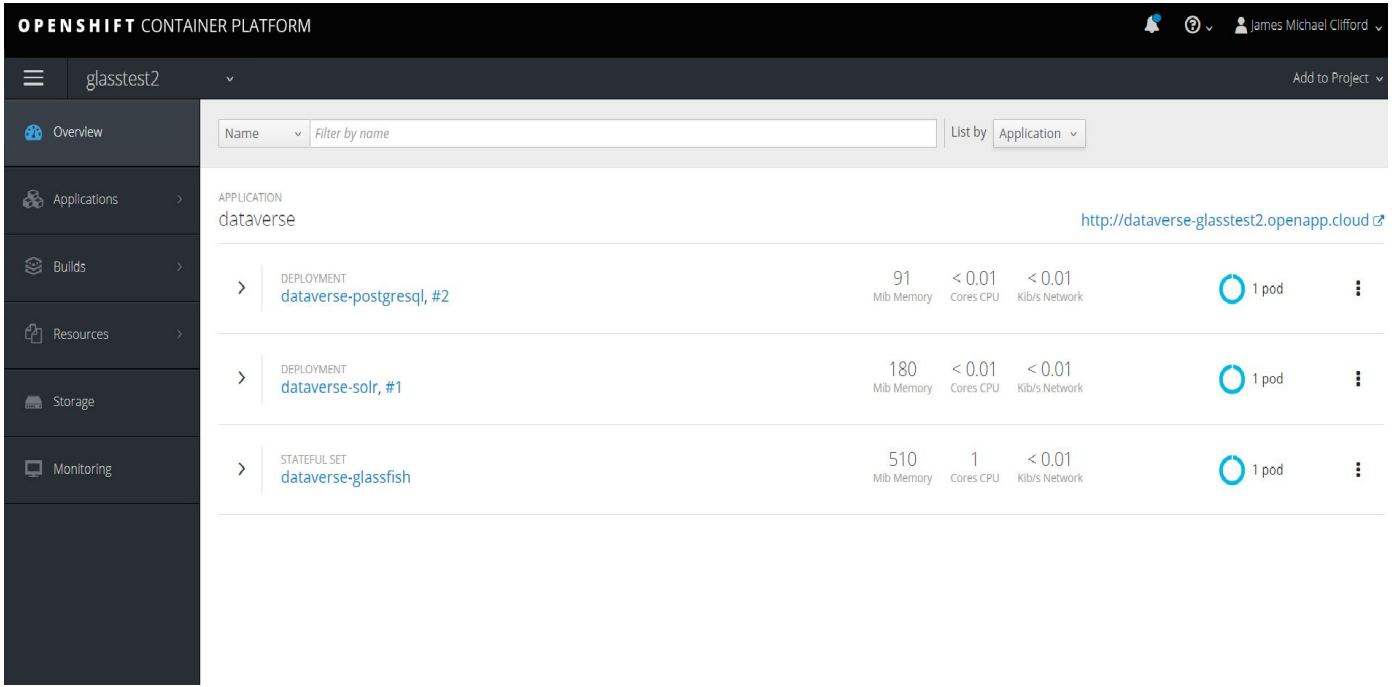
Patroni status

- We need to do further work to correctly configure services for client and for replication
- Additionally, Patroni is written for Kubernetes
- Unlike Kubernetes, OpenShift does not want containers to run as root
- Patroni wants to create folders and Postgres wants to run as specific user
- Temporarily allowing root, but would like to fix

MOC Deployment

- The ultimate goal of our project is to be able to deploy a scalable dataverse on the MOC.
- We have begun to deploy our dataverse images and config.json on the MOC
- Still working on successfully porting working minishift code to MOC openshift.

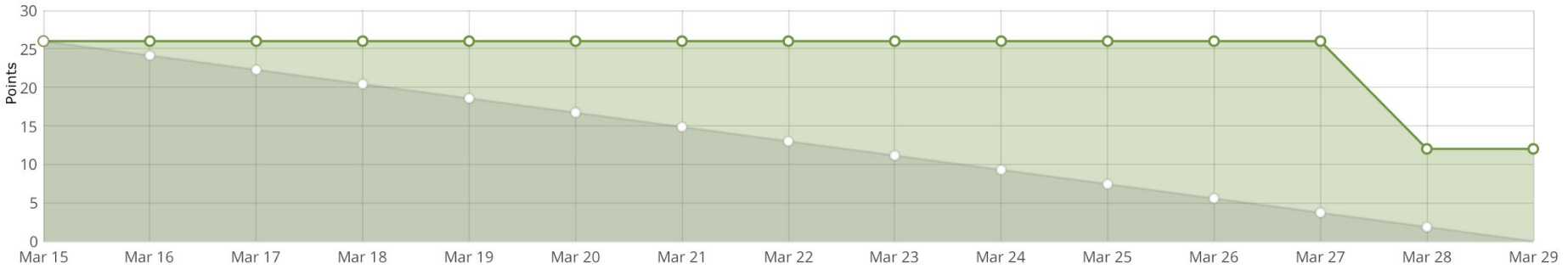
MOC Deployment



Sprint Burndown

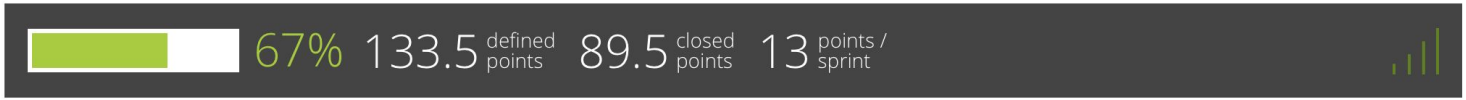
2018 BUCS528 DATAVERSE SCALE BU CS 528 CLOUD COMPUTING - DEMO 4 15 MAR 2018-29 MAR 2018

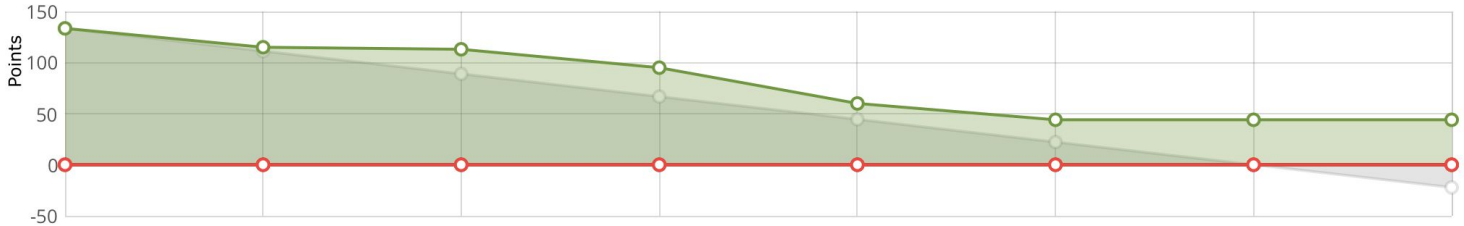
62% 26 total points 16 completed points 1 open tasks 3 closed tasks 0 iocaine doses



Project Burndown & next sprint

2018 BUCS528 DATAVERSE SCALE BACKLOG





- Patroni deployment
- Pull request
- Select tool for testing deployment (Apache Jmeter or bench)
- Test deployments on MOC

Release Planning

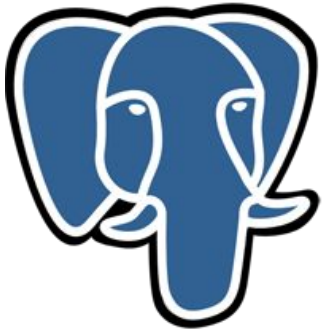
https://tree.taiga.io/project/msdisme-2018-bucs528-template-6/

THANKS!!

The Dataverse Project

Solr

redhat



PostgreSQL