Sprint 2 Demo

Building Cyber Infrastructure for Researchers

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What we learned this sprint:

Re-Defined Problem Statement:

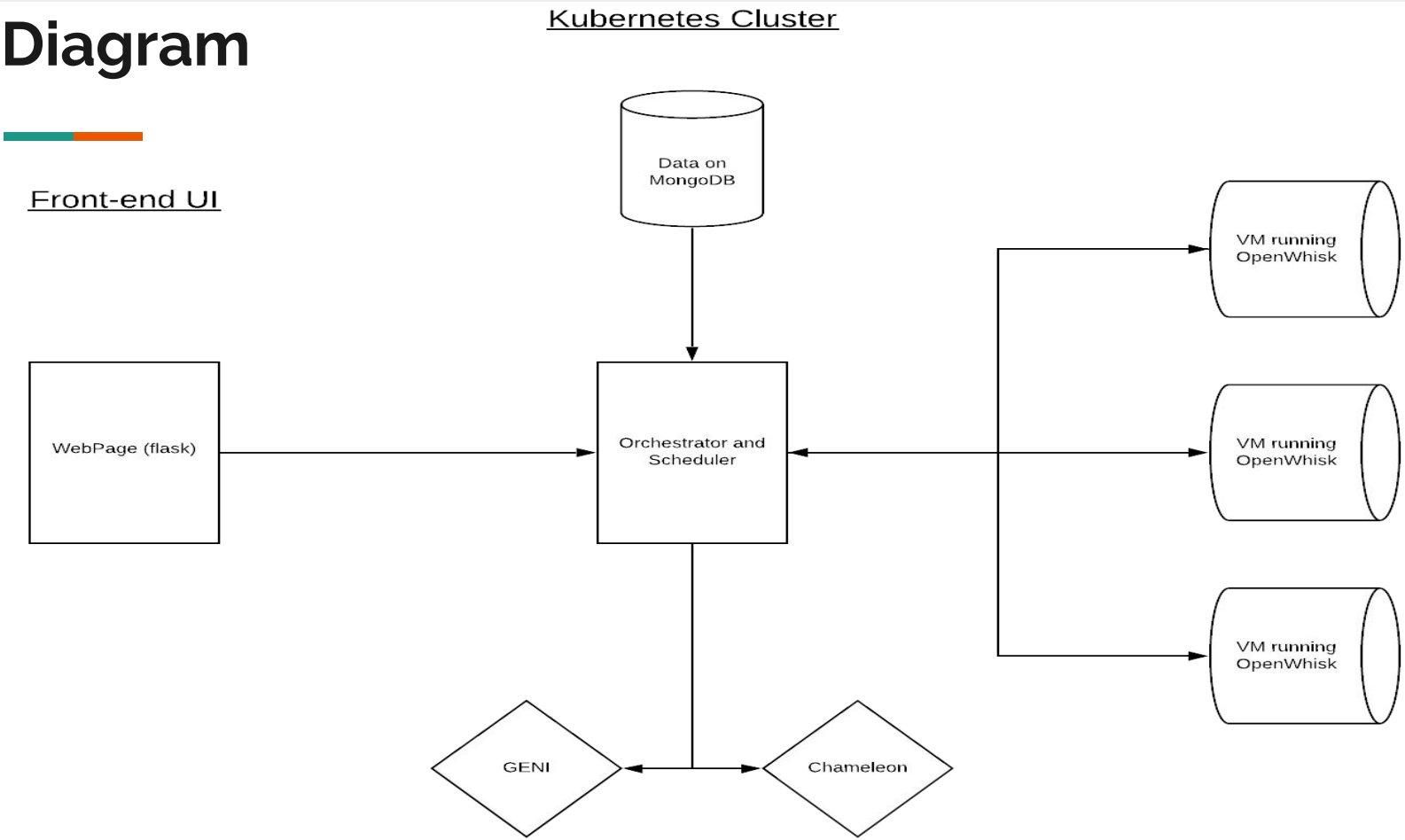
Users have stored large data sets utilizing **unreliable nodes** scattered throughout the U.S. They want to **run computations** on the data, so we need an **infrastructure layer** to create a reliable system where nodes are **available**.

Clarifying Cloud Computing Component

- Building an infrastructure layer to work with unreliable nodes
  - Chameleon & GENI are unreliable nodes used for computation
  - OpenWhisk is the open source platform for running functions
    - Focusing on FaaS for this project
  - Kubernetes is the container orchestrator where OpenWhisk runs
  - System will be deployed on the MOC

- Technologies and design decisions driven by cost & service flexibility

Structure Diagram



OpenWhisk on Ubuntu

- Initial steps followed for OpenWhisk install:
  - Use Ubuntu 18 (ubuntu 16 will have python2 conflict)
  - Run prereq.yml
  - Install npm
  - Install cryptography>=2.5

OpenWhisk on Ubuntu

- Hello.py

```
def main(dict):
    if 'name' in dict:
        name = dict['name']
    else:
        name = "stranger"
    greeting = "Hello " + name + "!"
    print(greeting)
    return {"greeting": greeting}
```

OpenWhisk on Ubuntu

- Running with OpenWhisk

```
ubuntu@test1:~$ wsk action invoke --result hello --param name World -i
{
    "greeting": "Hello World!"
}
```

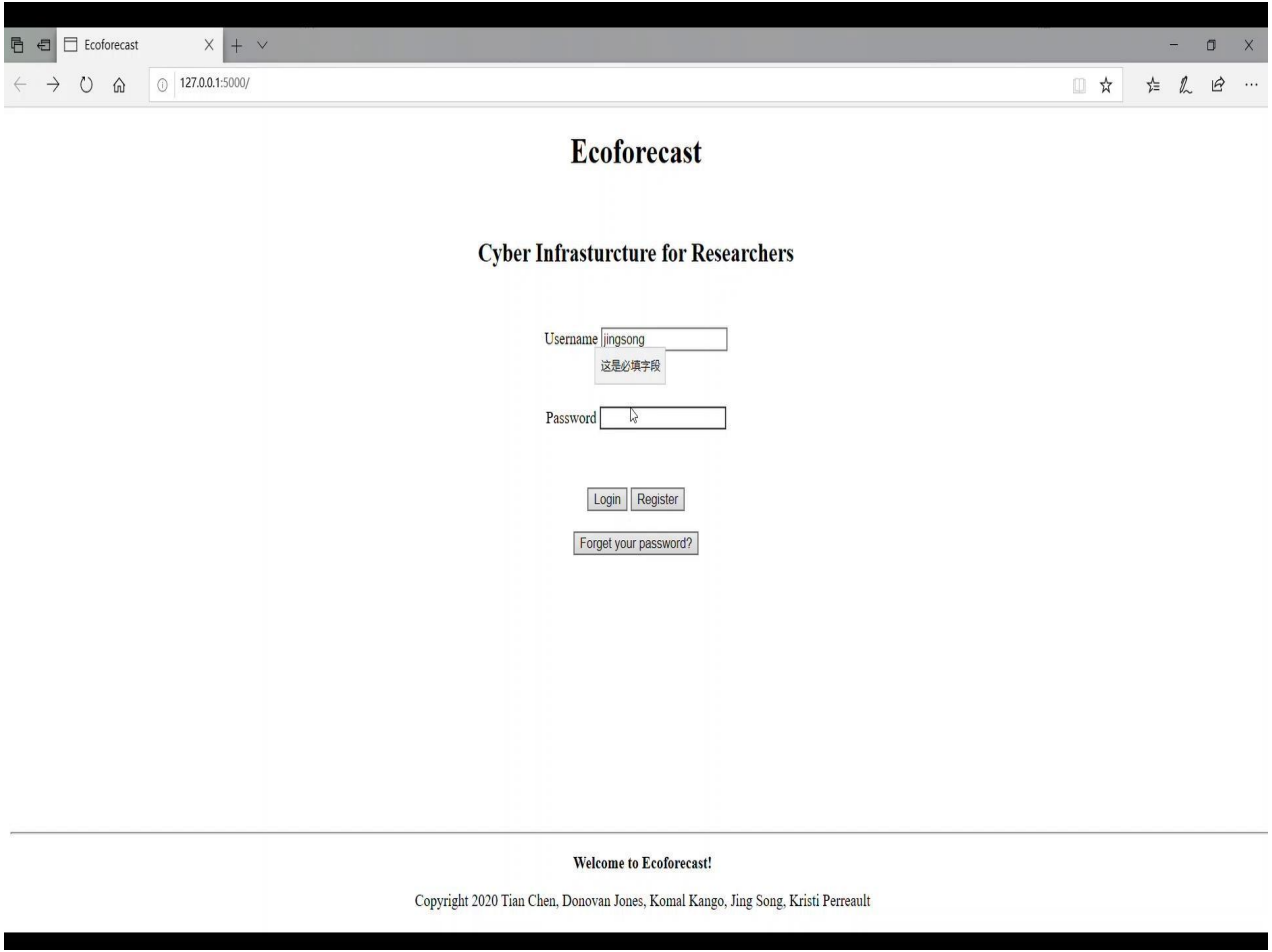
OpenWhisk on Ubuntu

- Lessons Learned
  - Input the commands in the right directory; username & password were not set correctly
  - Use the official documentation, not just GitHub tutorials
    - IBM updates OpenWhisk a lot, so tutorials we followed were out of date

UI Progress

- Basic web page for user login/register page
  - Python & Flask
- MongoDB for user management
- User dashboard started

UI Demo


Ecoforecast
127.0.0.1:5000/
Ecoforecast
Cyber Infrastucture for Researchers
Username jingsong
这是必填字段
Password
Login
Register
Forget your password?
Welcome to Ecoforecast!
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What we still need to learn:

- More about using OpenWhisk with Kubernetes
- How to work with Chameleon
  - Add/remove nodes with Kubernetes
- Stronger understanding of the MOC so that we can deploy the infrastructure

Release Planning

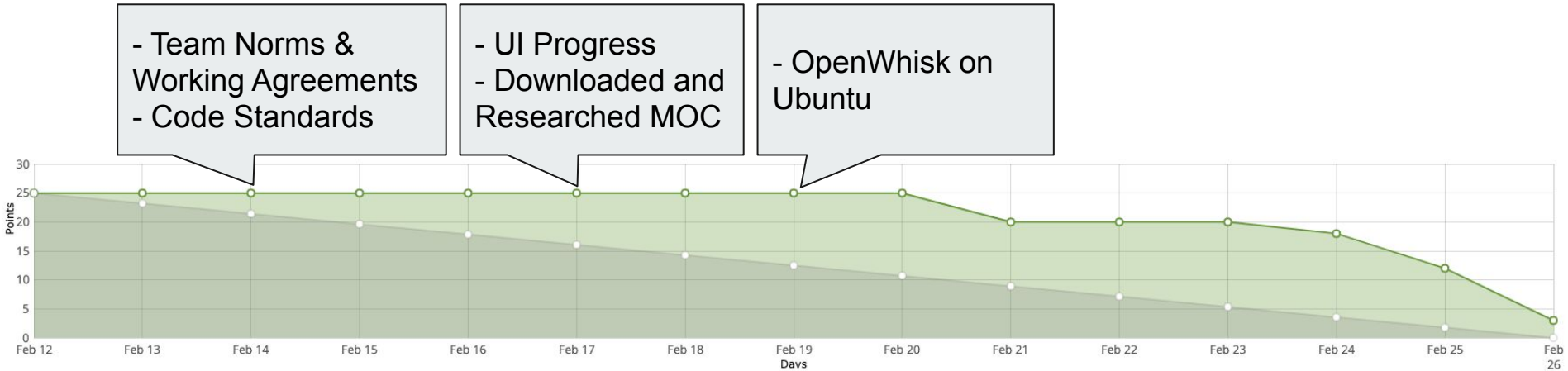
Release #2 (due week 4) - DONE

- Cloud computing component clarified, technologies finalized
- Access to MOC and OpenWhisk
- OpenWhisk running on one VM in MOC
- UI: user login & registration, dashboard, MongoDB
- Code standards & team working agreement

Release #3 (due week 6)

- OpenWhisk running on Kubernetes cluster
- Add & remove Chameleon nodes as workers on Kubernetes
- Write scripts to automate deployment and running functions
- Create basic UI to add/remove these nodes

Sprint 2 Burndown Chart



Questions?