

LSIT Infrastructure Intern

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Storage Migration

Transferring storage from Longhorn to Ceph Rados Gateway (RGW) to minimize overhead costs

Core Deliverables: Identifying the data, Exporting data, Logging/YAML

Longhorn:

Helps execute Kubernetes workloads extremely quick
Ideal for courses currently going and best on-demand performance
Open Source cloud native storage

Ceph RGW:

Established production environments
Reduces overhead cost due to existing infrastructure
Better for data that isn't accessed as frequently
Compatible with S3



LONGHORN



JupyterHub Self-Service

Portal for tracking student data being migrated

Core Deliverables: Setting up Go dev with Gin backend, Initialize Jenkins testing, Create login/logout endpoints for local testing, Documentation

Data Storage Structure in Go: Utilizing maps, initialized as strings later to be transferred into JWT Authentication

```
var userStore = map[string]string{
    "Smyanjaip": "pass123",
    "ScottWilliams": "pass345",
    "BrianMonroe": "pass567",
    "test": "test",
}
```

```
(GIN-debug) Environment variable PORT is undefined. Using port 8080 by default
(GIN-debug) Listening and serving HTTP on :8080
[GIN] 2025/02/07 - 13:08:42 | 200 | 111.609µs | 111.609µs | POST | "/api/login"
[GIN] 2025/02/07 - 13:52:32 | 404 | 798ns | 798ns | GET | "/api/login"
[GIN] 2025/02/07 - 13:52:32 | 404 | 1.062µs | 1.062µs | GET | "/favicon.ico"
[GIN] 2025/02/07 - 13:52:42 | 404 | 533ns | 533ns | HEAD | "/api/login"
[GIN] 2025/02/07 - 13:53:36 | 404 | 1.051µs | 1.051µs | HEAD | "/api/login"
```



Binderhub Integration

Working on documentation, use cases, and templates of Binderhub as an alternative to running Jupyterhub notebooks

Core Deliverables: Start the process of internal documentation for future use cases, Creating easily reproducible binderhub templates, testing templates

For Students:

Allowing students or faculty to collaborate on assignments and projects where all dependencies and code are managed in one central location

For Research:

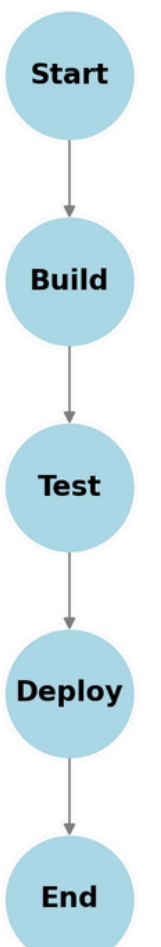
Allowing shared research where Binderhub would make it easy for others to reproduce their work with the same environment specifications and limitations as the original user



JupyterHub Self-Service - Jenkins Testing Structure

Importance of a testing pipeline:

- Ensures strong quality of code
- Allows developers to be on the same page with notifications and slack integration
- Allows automation to different environments between dev, staging, and production



```
apiVersion: v1
kind: ServiceAccount
metadata:
  name: jenkins
  namespace: jenkins
---
apiVersion: rbac.authorization.k8s.io/v1
kind: Role
metadata:
  name: jenkins
  namespace: jenkins
rules:
- apiGroups:
  - ""
  resources:
  - pods
  - services
  - configmaps
  - secrets
  - namespaces
  verbs:
  - get
  - list
  - watch
  - create
  - delete
  - update
  - patch
---
apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
metadata:
  name: jenkins
  namespace: jenkins
roleRef:
  kind: Role
  name: jenkins
  apiGroup: rbac.authorization.k8s.io
subjects:
- kind: ServiceAccount
  name: jenkins
  namespace: jenkins
```

Relevant Technologies

