

DevOps At a Glance



Jeffrey Sica
@jeeffy

Overview

- What is Slideless
- The Stack
- Typical Workflow
- Planned Improvements
- Final Thoughts
- Questions



What is Slideless

Business Definition:

Slideless is an early-stage Anatomic Pathology startup in Ann Arbor, MI.

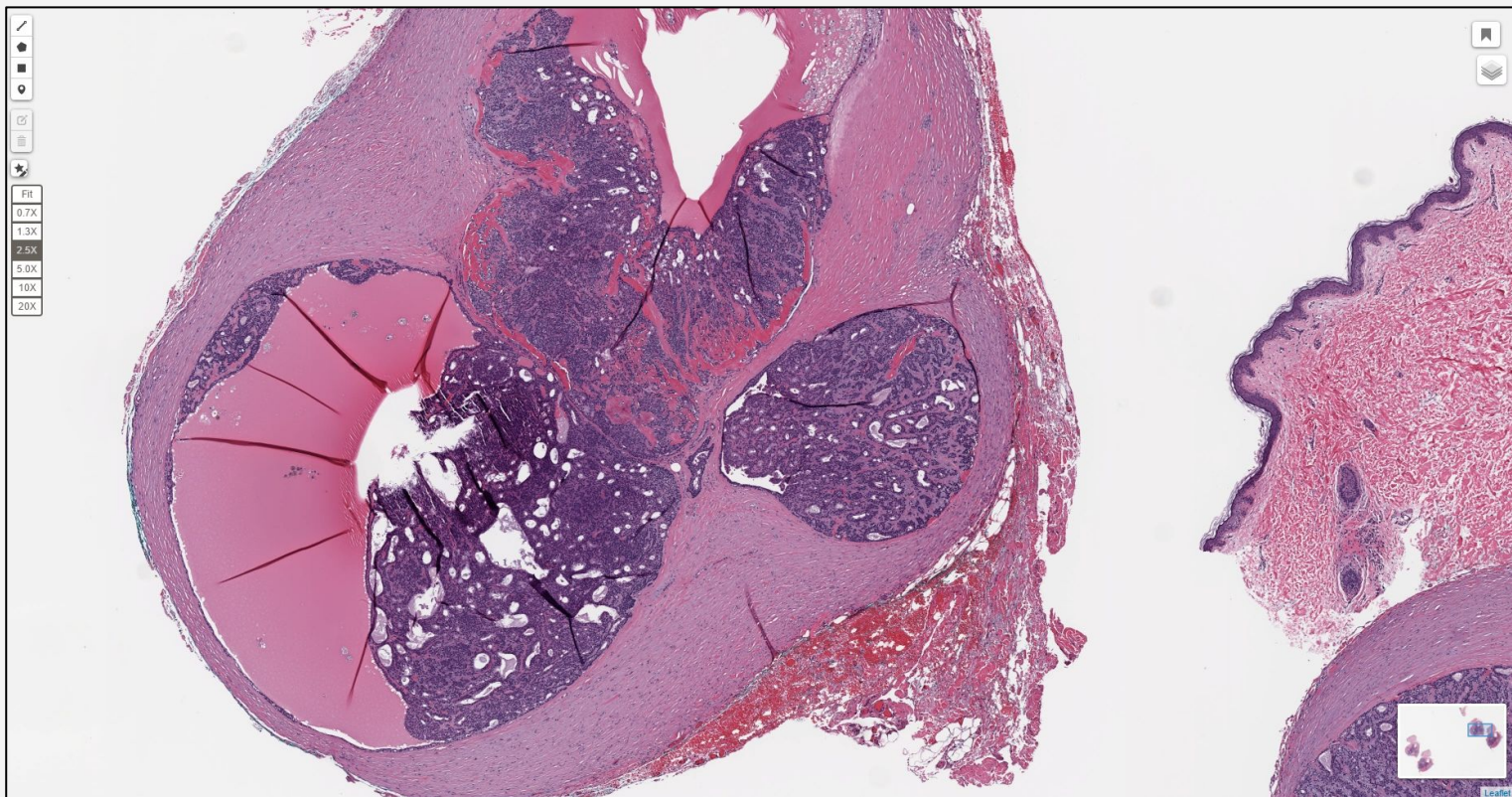
Slideless is commercializing its **Virtual Microscope** to empower the global migration from glass slides to digital imaging - in research, medical education, and clinical labs.

Techie Definition:

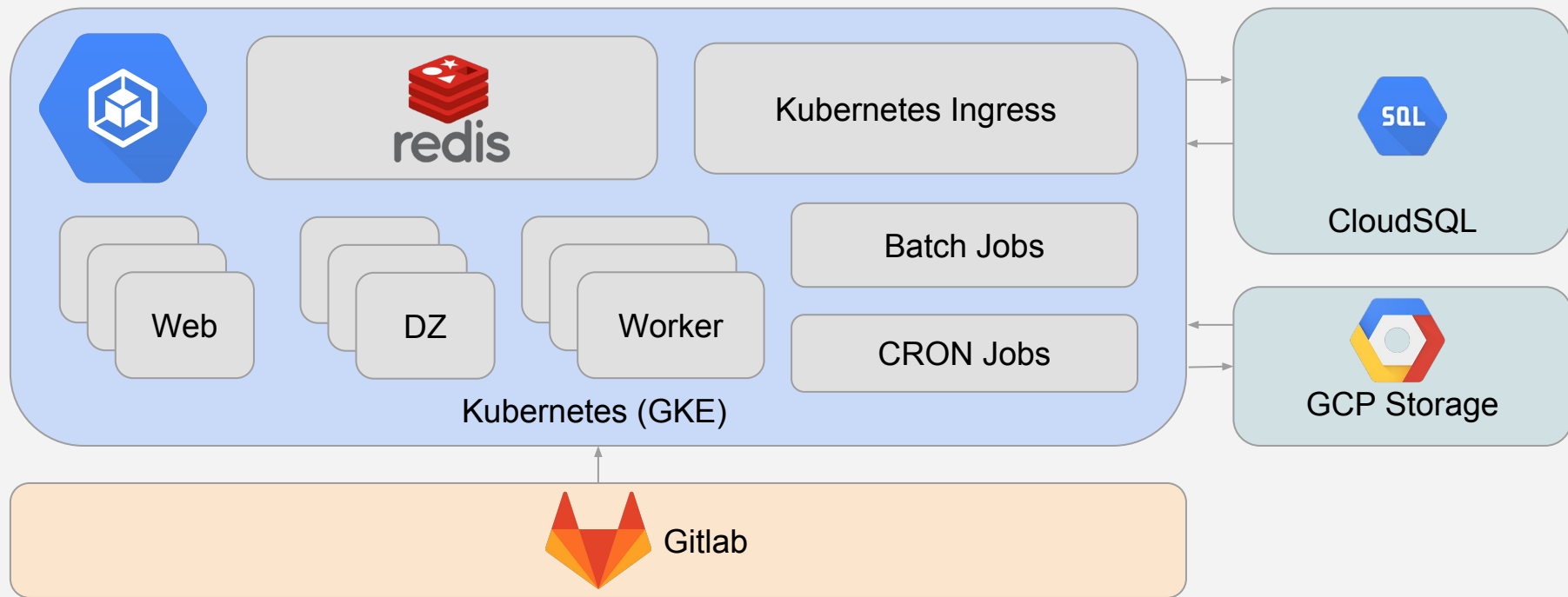
Slideless is a project to bring a Google Maps-esque streamlined UI to the digital pathology space.

We leverage cloud scale and cloud based GPUs to accelerate image archival and analysis.





The Stack - Overview



The Stack - GKE / Kubernetes



- Resilient and robust container orchestration
- Self-healing
- GKE handles patching Kubernetes
- Easy auto-scaling (if resource allocations are defined)
- Highly configurable
- Concept of batch-style jobs (fairly new)
- StackDriver

The Stack - GKE / Kubernetes



Some glue required

- kube-lego (<https://github.com/jetstack/kube-lego>) for LetsEncrypt
- cloudsql-proxy (<https://github.com/GoogleCloudPlatform/cloudsql-proxy>) to more easily interact with GCP CloudSQL
- kubelet container w/ auth for k8s API calls

The Stack - GKE / Kubernetes



```
---
apiVersion: extensions/v1beta1
kind: Deployment
metadata:
  name: deepzoom
spec:
  revisionHistoryLimit: 1
  replicas: 1
  template:
    metadata:
      labels:
        app: deepzoom
    spec:
      containers:
        - image: registry.gitlab.com/slideless/deepzoom:master
```


The Stack - Gitlab

- Using the cloud hosted version
- Multi-purpose
 - Source Control
 - Project Management
 - CI/CD
- Free build workers (if you're patient)



| All 51 | | | | Pending 0 | Running 0 | Finished 51 | Branches | Tags |
|--------|---------------------------|---|--------|-----------|-----------|-------------|----------|------|
| Status | Pipeline | Commit | Stages | | | | | |
| passed | #8623614 by [user] latest | develop -> a8af059c improved screenshot function... | ✓ | ✓ | ✓ | | | |
| passed | #8618812 by [user] | develop -> 80882bb7 fix issue #7 | ✓ | ✓ | ✓ | | | |
| passed | #8593291 by [user] | develop -> a4e8282e fixes #1 adds screenshot butt... | ✓ | ✓ | ✓ | | | |
| passed | #8434690 by [user] latest | master -> c14bdb59 Merge branch 'develop' into '... | ✓ | ✓ | ✓ | | | |

The Stack - Gitlab

```
image: docker:latest
services:
  - docker:dind

build:
  stage: build
  script:
    - docker login -u gitlab-ci-token -p $CI_JOB_TOKEN registry.gitlab.com
    - docker build --pull -t $CONTAINER_IMAGE .
    - docker push $CONTAINER_IMAGE
```



The Stack - Gitlab



```
k8s-deploy:
  image: google/cloud-sdk
  stage: deploy
  only:
    - master
    - develop
  script:
    - echo "$GOOGLE_KEY" > key.json
    - gcloud auth activate-service-account --key-file key.json
    - gcloud config set compute/zone us-east1-d
    - gcloud config set project herpderpomghi2u
    - gcloud config set container/use_client_certificate True
    - gcloud container clusters get-credentials prod
    - kubectl --namespace=$CI_COMMIT_REF_NAME set image deployment/deepzoom deep
    - kubectl --namespace=$CI_COMMIT_REF_NAME patch deployment worker -p '{"spec
```

Planned Improvements

- DNS per-branch automatically (Push branch new-ui, get new-ui.slideless.co)
- Better logging / alerts (Because StackDriver is sad)
- Move from Kubernetes deployments to using Helm/Tiller
- GPU nodes in GKE once 1.7 drops
<https://github.com/kubernetes/kubernetes/issues/44107>
- Service mesh (istio or linkerd)



Final Thoughts

- GKE has matured but still has some issues
- StackDriver makes me sad
- Gitlab makes things easy
- GitlabCI handles 80% of build cases (and is improving)
- Keep everything pluggable. Keep improving.



Questions and Discussion



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