



CI/CD Pipeline mit Gitlab CI und Kubernetes

Johannes M. Scheuermann



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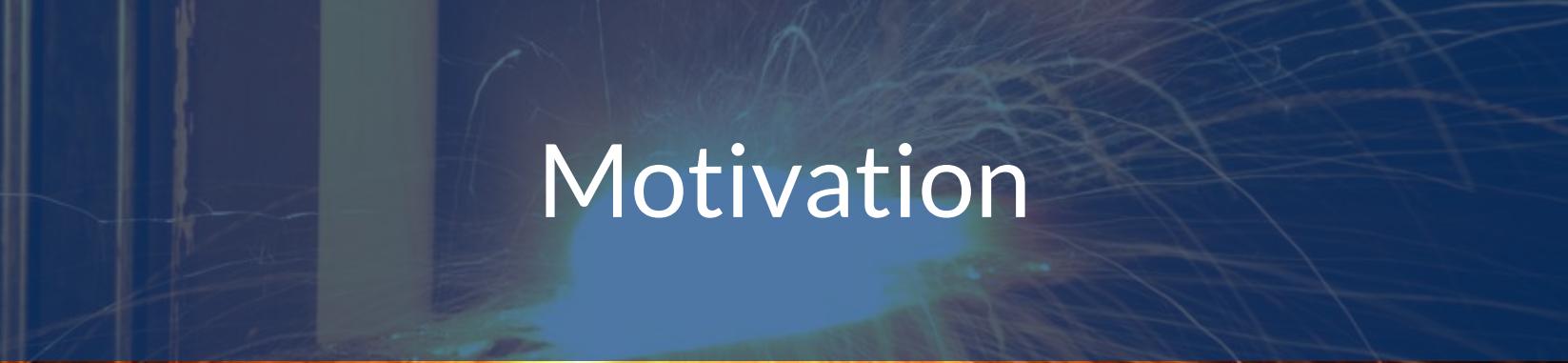
Cloud Platform Engineer @ inovex

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A photograph of a dark night sky filled with stars. A horizontal band of deep blue serves as a background for the text. In the bottom center, the silhouette of a person standing on a grassy hill is visible against the starry background.

What about you?



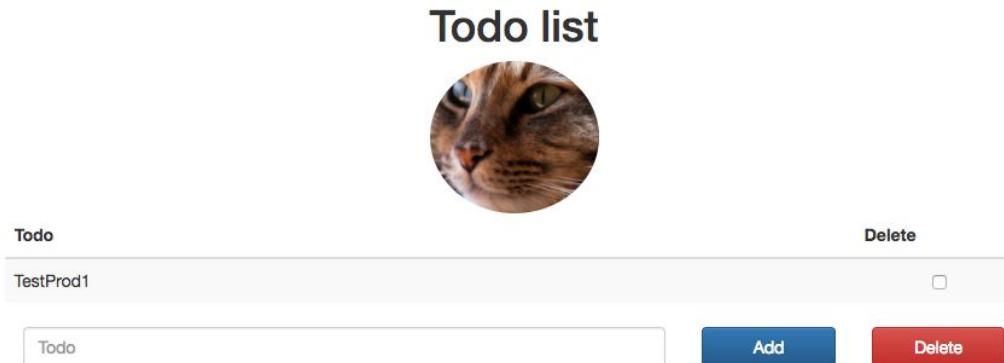
Motivation

To Do
List
- Everything ??

Scenario: ToDo Webapp

Introduction

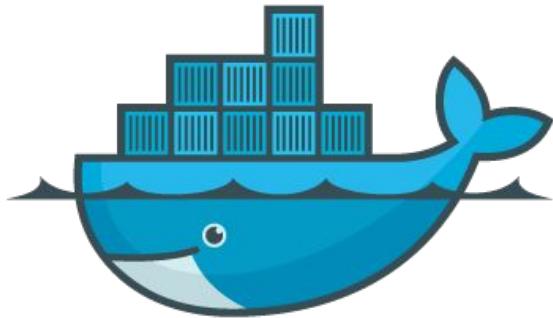
- Use Case: Managing Tasks
- HTML/CSS/JS, Golang
- Redis (Master/Slave)



Technologies



Gitlab



Docker



Kubernetes



How to build your binary?

Container-based Build Slaves



Gitlab CI



Pipeline

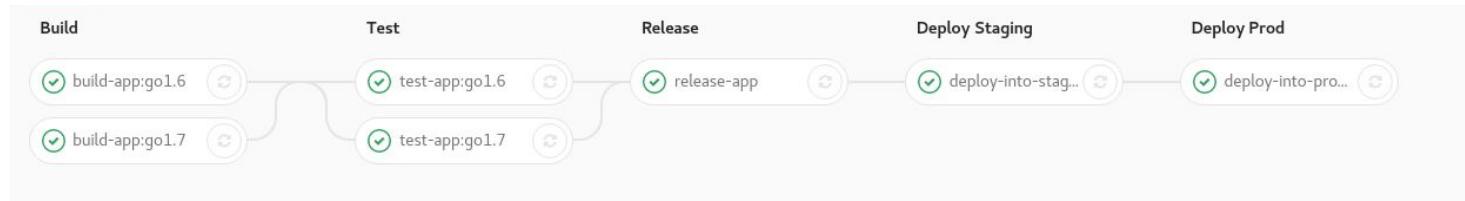


Pipeline

Commit



Tag



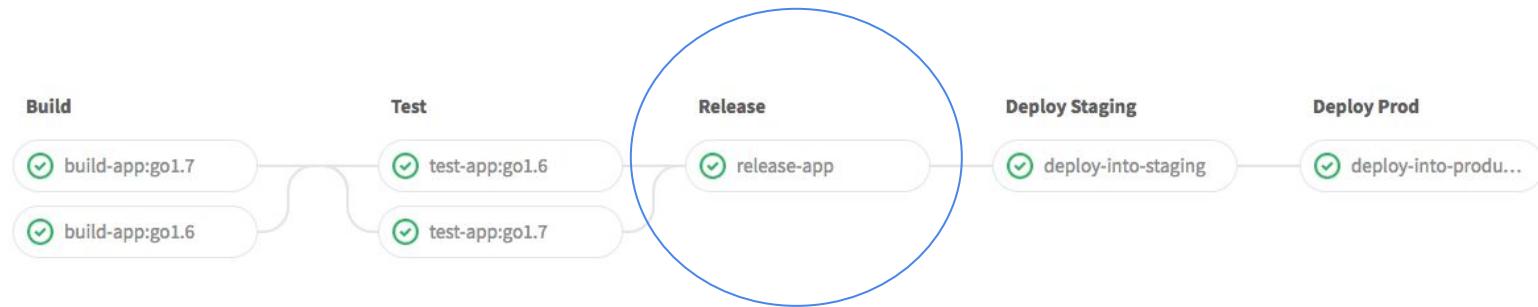
Pipeline



Configuration

```
75 build-app:go1.7:
76   stage: build
77   image: golang:1.7
78   variables:
79     go_version: "1.7"
80   <<: *build_app_yaml_definition
81
82 .build_app_yaml_template: &build_app_yaml_definition # Hidden job that defines
83   tags:
84     - shared
85   artifacts:
86     expire_in: 2 days
87     paths:
88       - bin/*.bin
89   script:
90     - export GOPATH="${HOME}/go"
91     - export GOBIN="${GOPATH?}/bin"
92     - mkdir -p $GOPATH $GOBIN
93     - go env
94     - go get
95     - artifact_version=${CI_BUILD_TAG}
96     - test -z "${artifact_version?}" && artifact_version=${CI_BUILD_REF:0:7}
97     - CGO_ENABLED=0 GOOS=linux GOARCH=amd64 go build -ldflags "-s -w -X main.a
```

Pipeline



Configuration

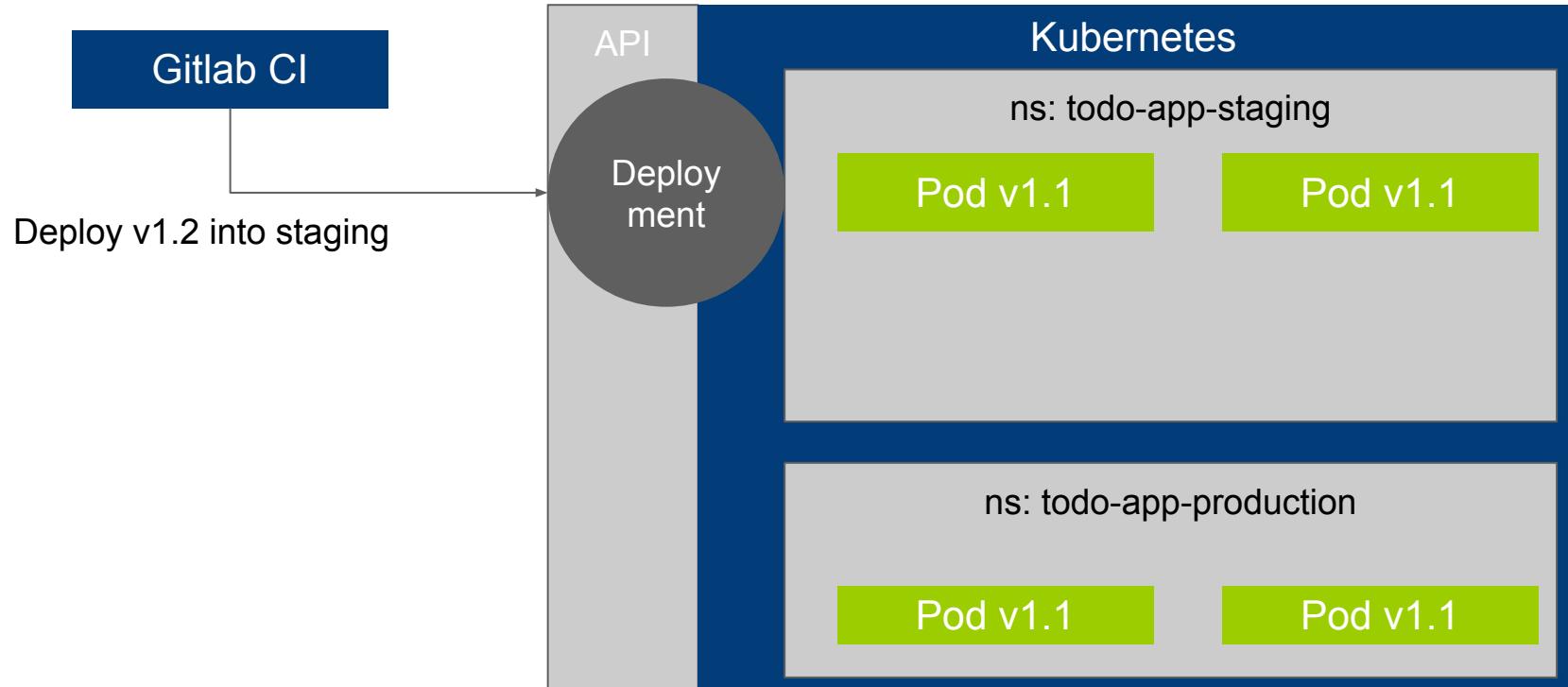
```
100 release-app:
101   stage: release
102   image: docker:latest #TODO latest?
103   tags:
104     - shared
105   only:
106     - tags
107   dependencies: # Retrieve Artifacts (http://docs.gitlab.com/ce/ci/yaml/README.html#dependencies)
108     - build-app:g01.7
109   variables:
110     go_version: "1.7"
111   script:
112     - ln -s todo-app.go${go_version?}.bin bin/todo-app
113     - docker login -u _json_key -p "${REGISTRY_JSON_KEYFILE?}" https://eu.gcr.io
114     - image_name="eu.gcr.io/${CI_K8S_PROJECT?}/todo-app-web:${CI_BUILD_TAG?}"
115     - docker build -t ${image_name?} .
116     - docker push ${image_name?}
117     - echo "Your new image is '${image_name?}'. Have fun!"
```

Typical CI/CD Problems

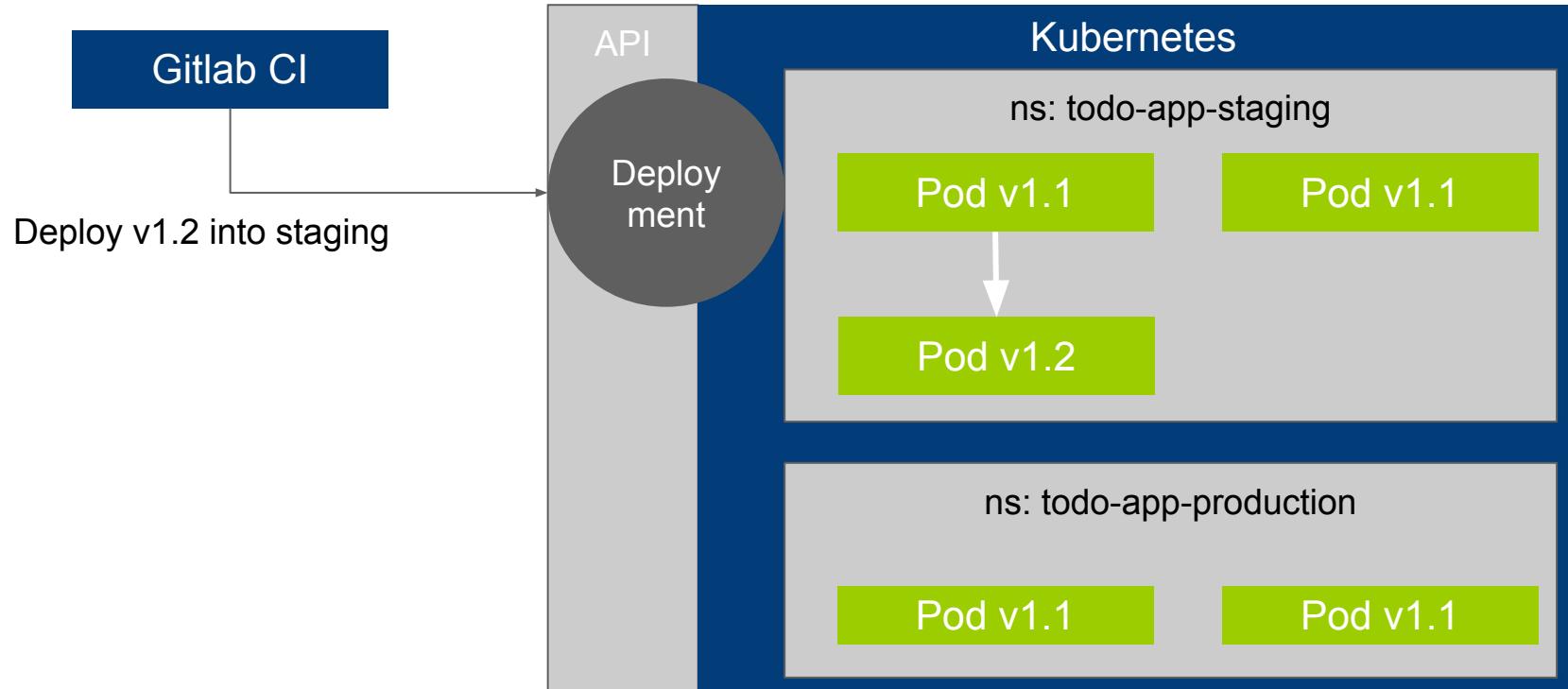
- ★ Build-Software dependencies ✓
- ★ Reproducible builds ✓
- ★ Automated Rollout
- ★ Rollbacks
- ★ Isolated feature testing

Deploy to Kubernetes

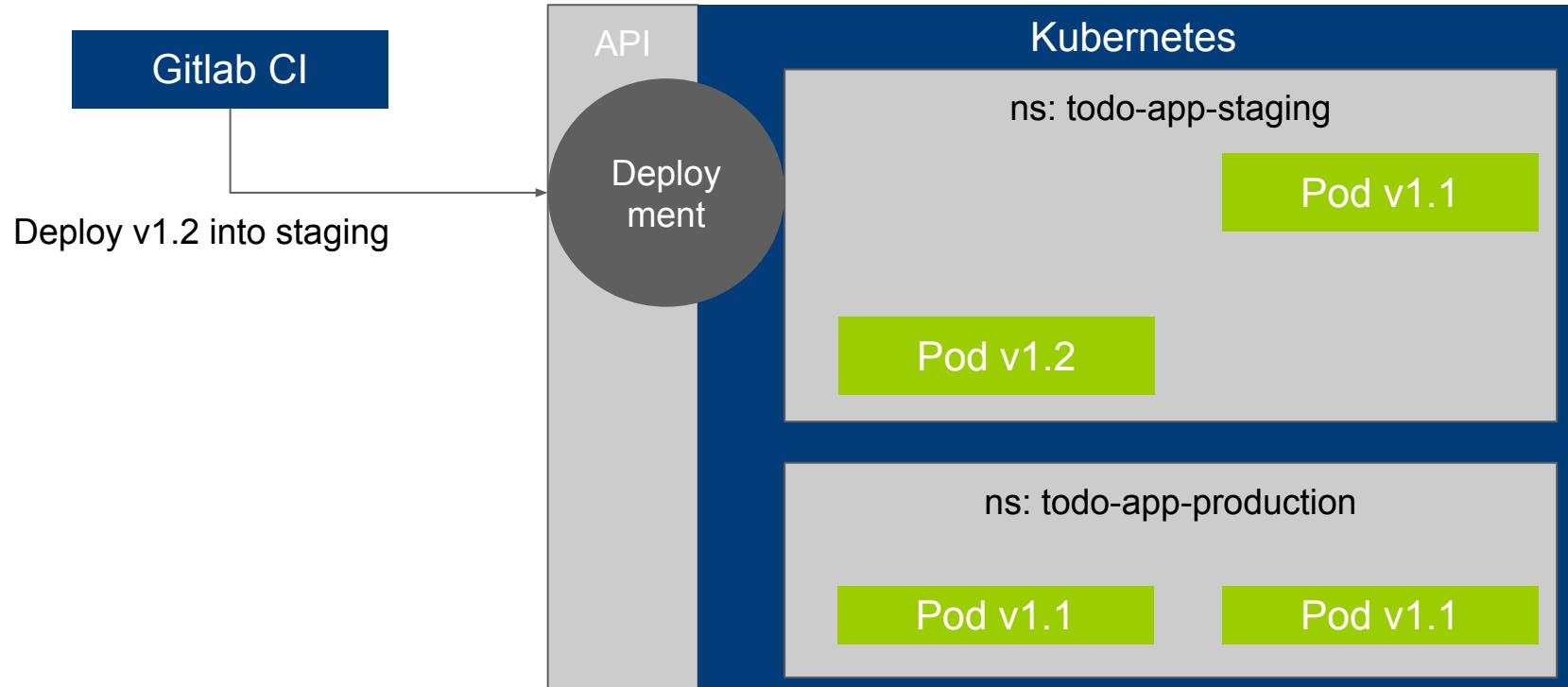
Kubernetes Deployment



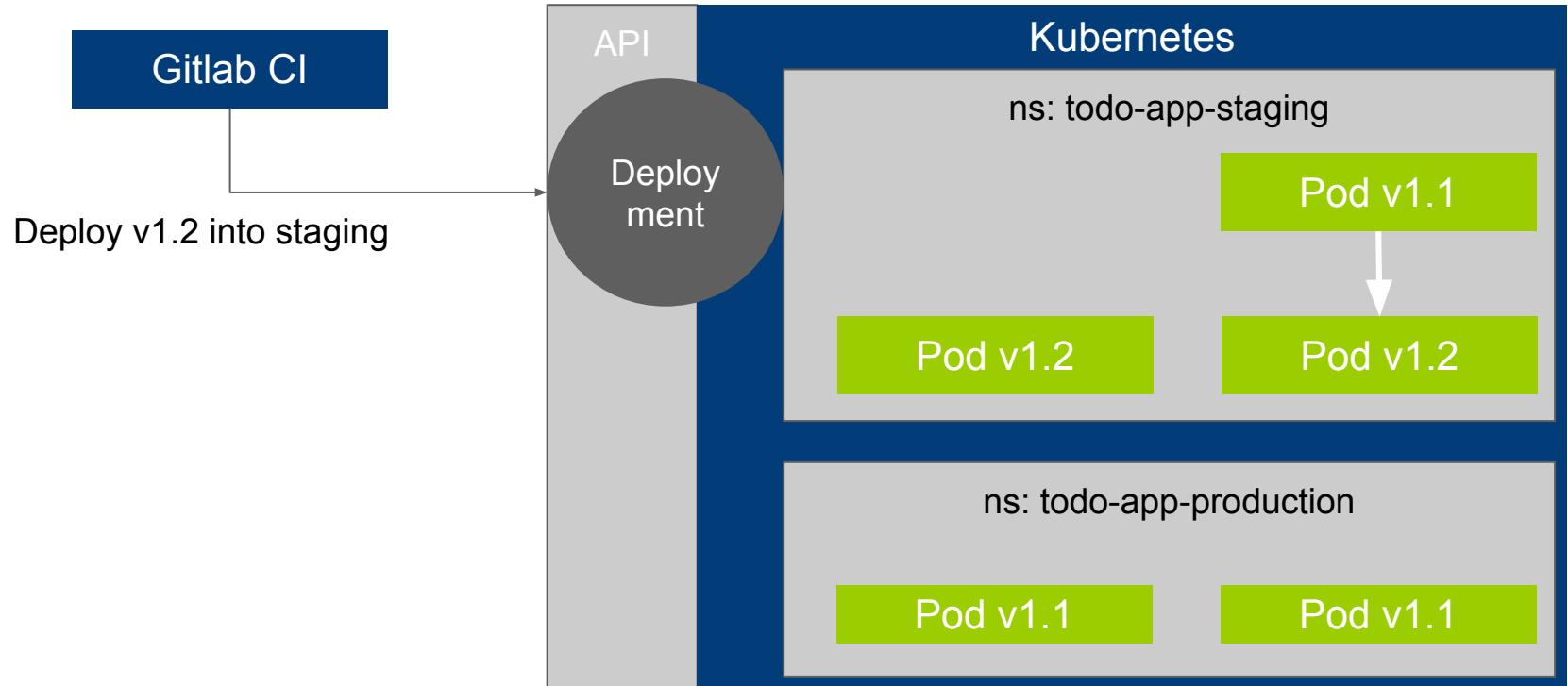
Kubernetes Deployment



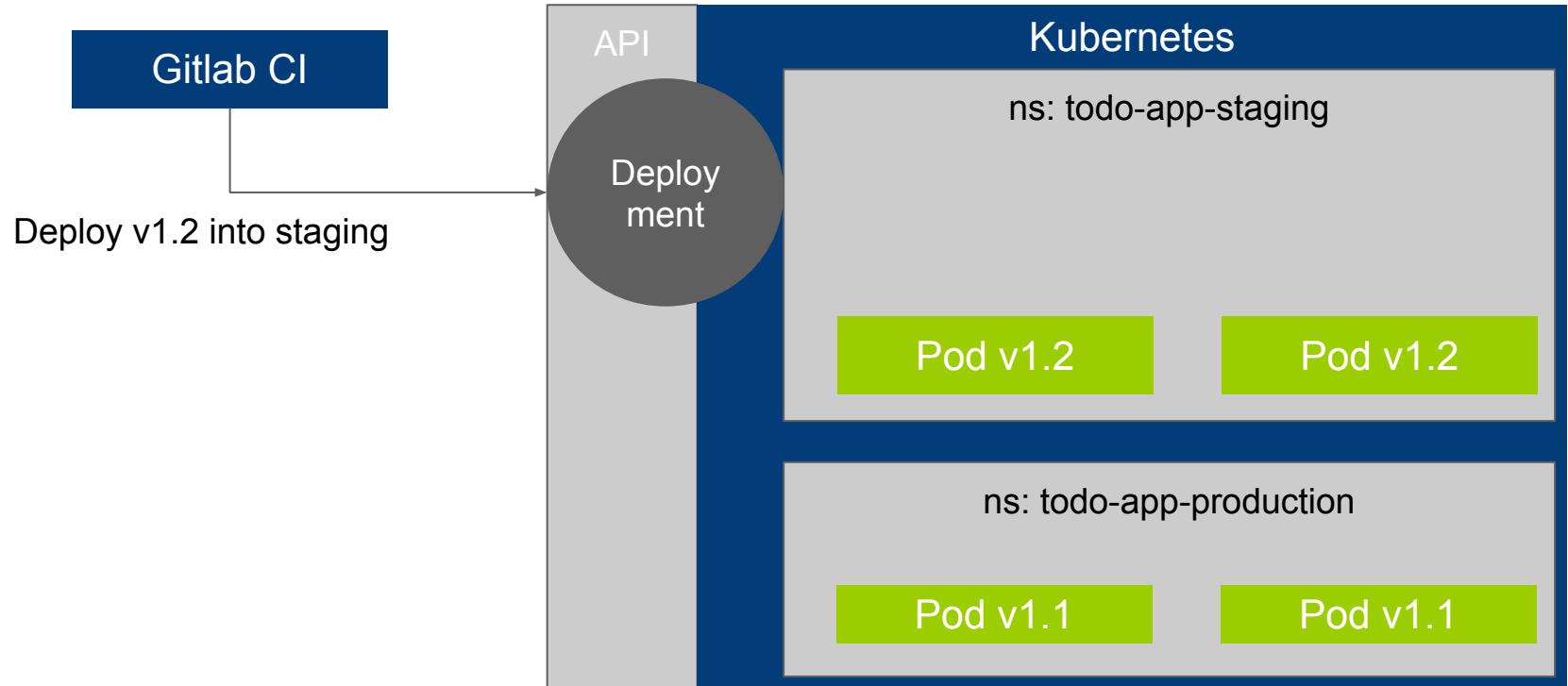
Kubernetes Deployment



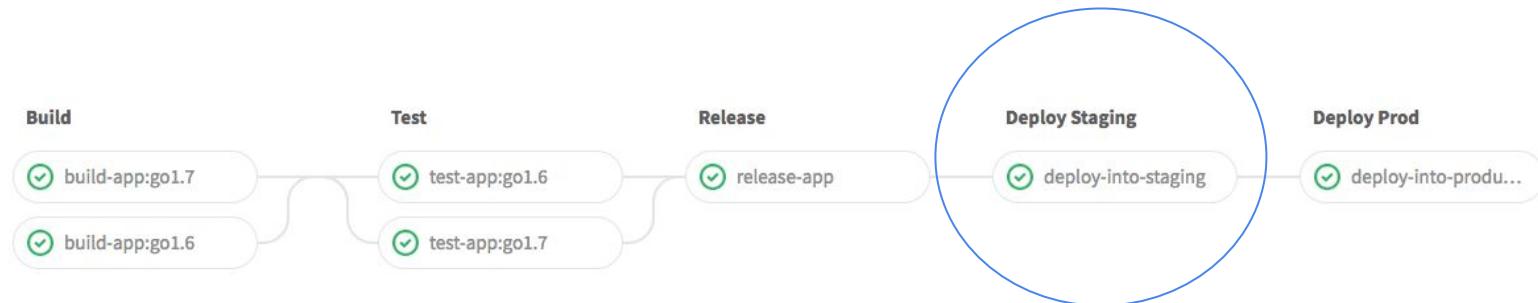
Kubernetes Deployment



Kubernetes Deployment



Pipeline



Configuration

```
119 # DEPLOY
120
121 deploy-into-staging:
122   stage: deploy-staging
123   environment: staging
124   image: docker:latest #TODO latest?
125   tags:
126     - shared
127   only:
128     - tags
129   when: manual
130   variables:
131     k8s_namespace: todo-app-staging
132 <<: *get_kubectl_yaml_template #inserts before_script definition
133   script:
134     - image_name="eu.gcr.io/${CI_K8S_PROJECT?}/todo-app-web:${CI_BUILD_TAG?}"
135     - kubectl config use-context default-context-staging
136     - kubectl --namespace=${k8s_namespace?} set image deployment/todo-app todo-app=${image_name?}
```

Typical CI/CD Problems

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- ★ Rollbacks
- ★ Isolated feature testing

Environments

Environment	Last deployment	Job	Commit	Updated	
production	#17 by 	deploy-into-production #51 49596	→ 1d8d17e5 Revert "updating html template"	4 months ago	 
staging	#15 by 	deploy-into-staging #5149 518	→ fdff04cf make fancy title	4 months ago	 

Rollback

production				Edit	Stop
ID	Commit	Job	Created		
#17	 v0.3 ↔ 1d8d17e5  Revert "updating html templat...	deploy-into-production (#5149596) by 	4 months ago		Re-deploy
#16	 v0.5 ↔ fdff04cf  make fancy title	deploy-into-production (#5149519) by 	4 months ago		Rollback
#14	 v0.3 ↔ 1d8d17e5  Revert "updating html templat...	deploy-into-production (#5149157) by 	4 months ago		Rollback

Typical CI/CD Problems

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- ★ Rollbacks ✓
- ★ Isolated feature testing

Review Environments

Environment	Last deployment	Job	Commit	Updated	
production	#17 by 	deploy-into-production #51 49596	→ 1d8d17e5 Revert "updating html template"	4 months ago	 Re-deploy
▼ review 2					
review/feature-4711	#22 by 	deploy-into-review #12098 976	→ 3fc1bad9  Update .gitlab-ci.yml	6 minutes ago	Re-deploy
review/feature-1337	#21 by 	deploy-into-review #12098 959	→ 3fc1bad9  Update .gitlab-ci.yml	6 minutes ago	Re-deploy
staging	#15 by 	deploy-into-staging #5149 518	→ fdff04cf make fancy title	4 months ago	 Re-deploy

Config

```
121  
122 deploy-into-review:  
123   stage: deploy-review  
124   environment: review/${CI_BUILD_REF_NAME}  
125   image: docker:latest #TODO latest?  
126   tags:  
127     - shared  
128   only:  
129     - branches  
130   except:  
131     - master  
132   script:  
133     - echo "deploy ${CI_BUILD_REF_NAME} into environment."  
134
```

Typical CI/CD Problems

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- ★ Rollbacks ✓
- ★ Isolated feature testing ✓

Demo Time: Video!



youtu.be/Ly_f221O6Fo

Assets & Links



gitlab.com/inovex/pa-todo-app-web



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