CI\CD project

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for Andersen Lab

Contacts

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For joke: runalsh.ru (its a trap!)

City:
Kazan
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Jan 2022

Developing	Integration	Operating
Build	**Continuous Integration**	**Continuous Development**

Code

Versioning

GitLab

AWS CodeCommit

GitHub

Bitbucket

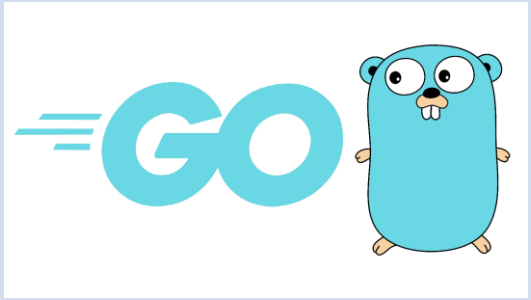
Pipeline

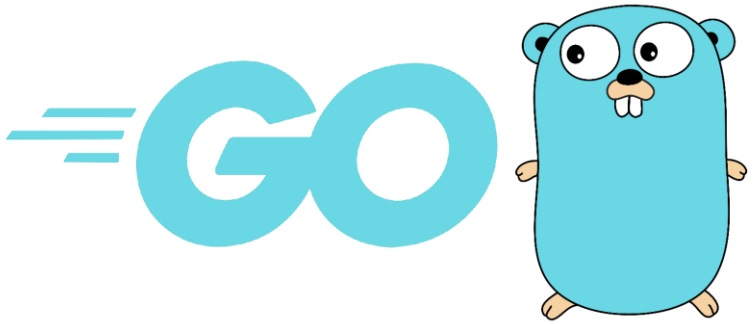
Buildkite

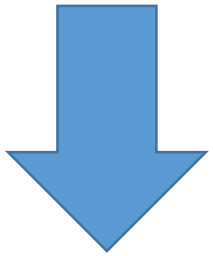
GitHub Actions

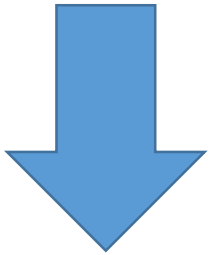
Why?

Tests

TESTS =>	CODE	BUILD	SEC
			
			



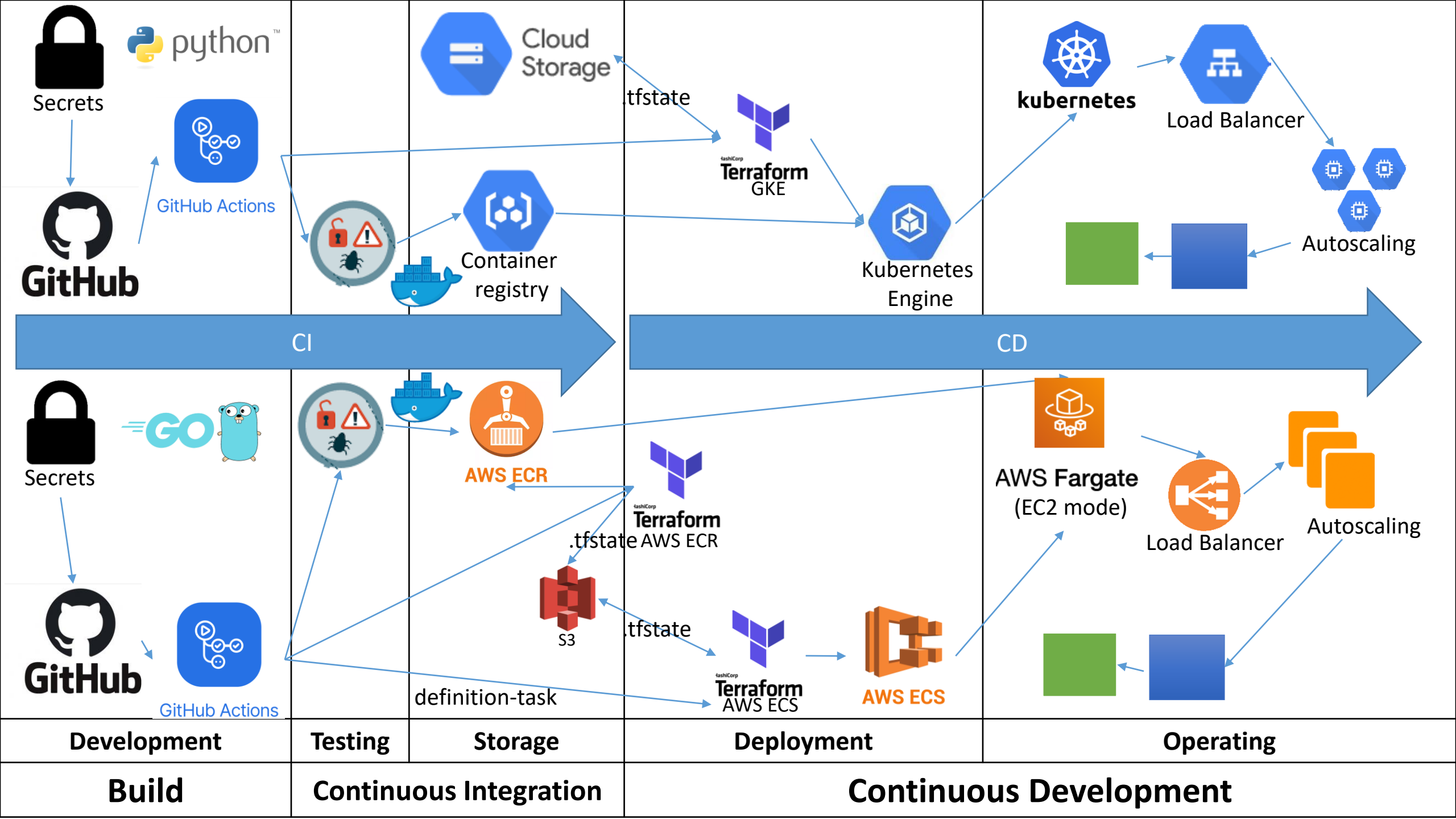




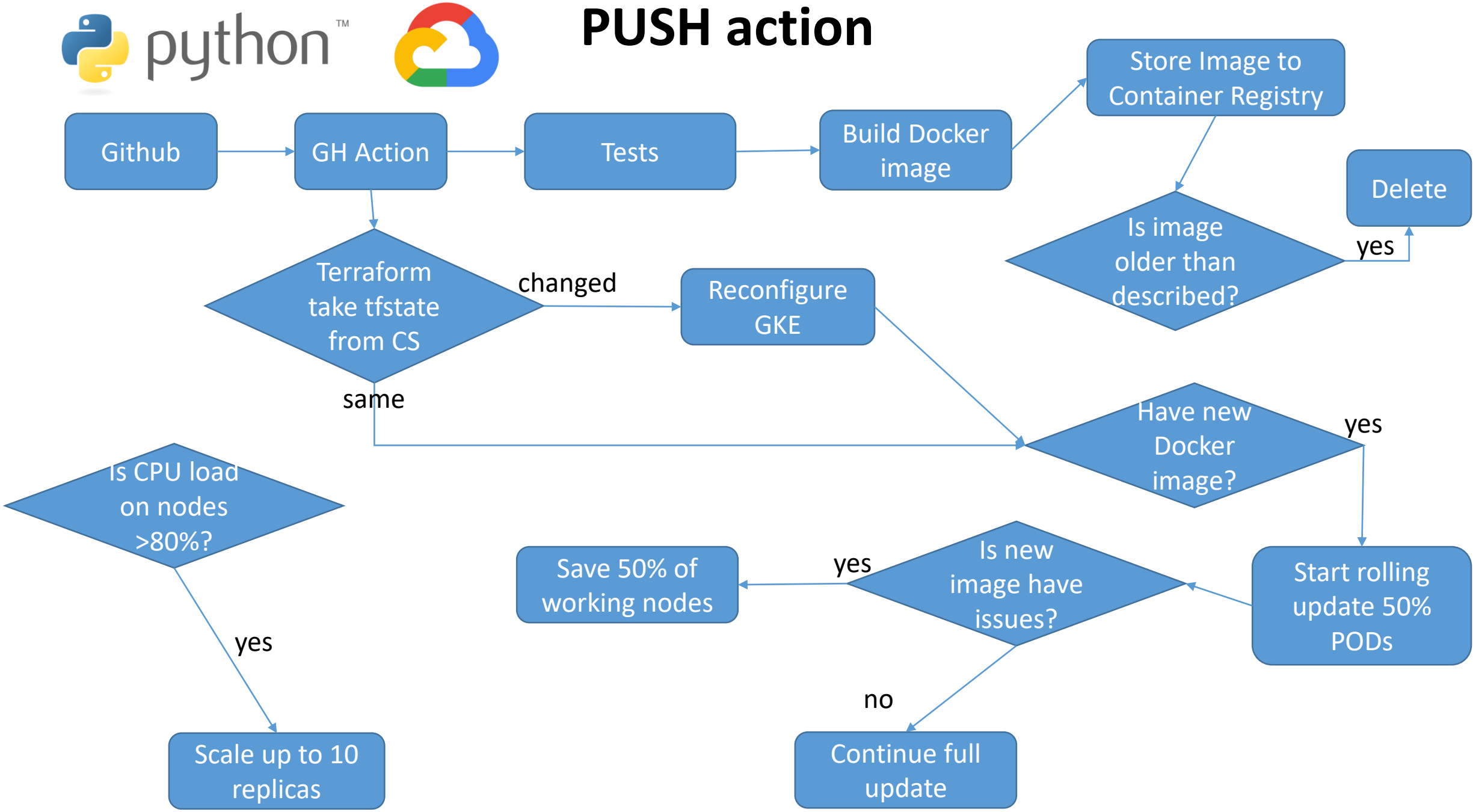
WHY?!

J4F :D

Google Cloud


Secrets
python
GitHub Actions
GitHub
Cloud Storage
.tfstate
Terraform
GKE
kubernetes
Load Balancer
Container registry
Kubernetes Engine
Autoscaling
CI
CD
Secrets
AWS ECR
Terraform
AWS ECR
.tfstate
AWS Fargate
(EC2 mode)
Load Balancer
Autoscaling
S3
.tfstate
GitHub
GitHub Actions
definition-task
Terraform
AWS ECS
AWS ECS
Development
Testing
Storage
Deployment
Operating
Build
Continuous Integration
Continuous Development

PUSH action


Github
GH Action
Tests
Build Docker image
Store Image to Container Registry
Delete
Is image older than described?
yes
Terraform take tfstate from CS
changed
Reconfigure GKE
same
Have new Docker image?
yes
Is CPU load on nodes >80%?
yes
Scale up to 10 replicas
Save 50% of working nodes
yes
Is new image have issues?
Start rolling update 50% PODs
no
Continue full update

PUSH action

Github

GH Action

Tests

Build Docker image

Store Image to ECR

Is number image more than described?

yes

Delete

Take definition task from Fargate

Is Terraform ECR state changed?

yes

Modify ECR

Save 50% of working tasks

Start rollback to previous working version

Continue full update

Is Terraform ECS state changed?

yes

Modify ECS

Is network LB more than described?

yes

Scale up to 4 instances

Is new image have issues?

yes

no

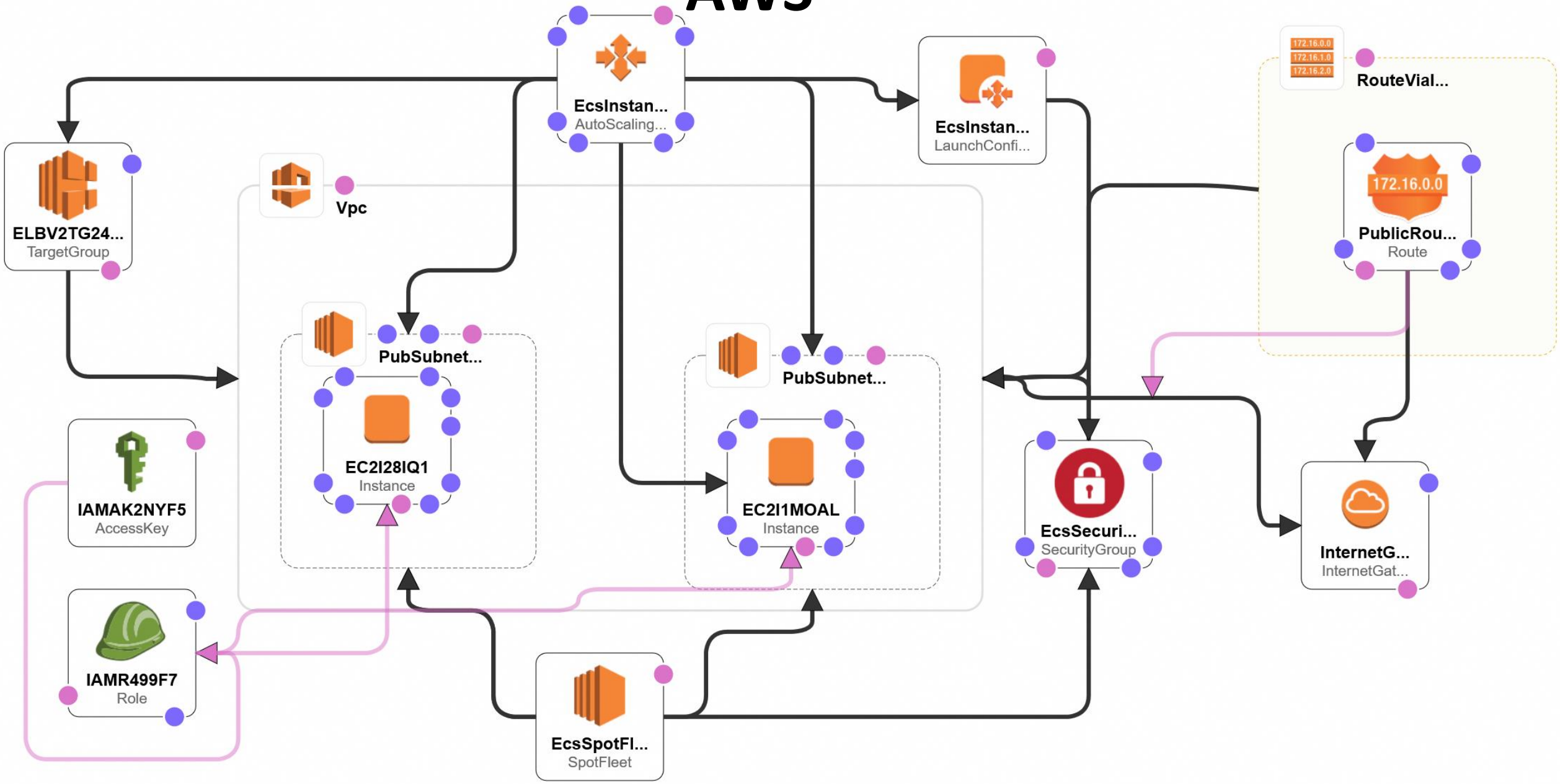
Push New image to 50% Fargate Cluster tasks

Is Docker image changed?

no

yes

AWS


EcsInstan...
AutoScaling...
EcsInstan...
LaunchConfi...
RouteVial...
ELBV2TG24...
TargetGroup
Vpc
172.16.0.0
PublicRou...
Route
PubSubnet...
PubSubnet...
EC2I28IQ1
Instance
EC2I1MOAL
Instance
IAMAK2NYF5
AccessKey
EcsSecuri...
SecurityGroup
InternetG...
InternetGat...
IAMR499F7
Role
EcsSpotFl...
SpotFleet

DOCKER
images size

Image URI

082046016299.dkr.ecr.eu-central-1.amazonaws.com/gorepo

Digest

sha256:a7a6e062751200931ecbf441c86001a6a26007d517192311fb7756d284bd4658

Image tags	Repository
go-image-95f9f7f7fa57a43686709aef8ea62633c083fd7c	gorepo
Pushed at	**Size (MB)**
10 января 2022 г., 13:21:05 (UTC+03)	7.39

Type

Artifact media type	Image manifest type
application/vnd.docker.container.image.v1+json	application/vnd.docker.distributi

Basic scanning

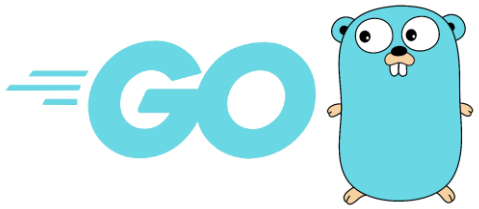
Scan status	Vulnerabilities
Not supported	-

py-app

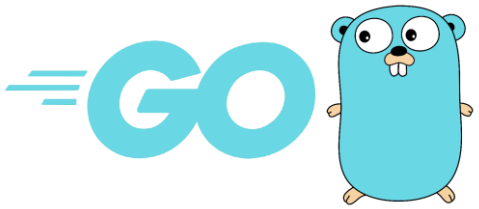
gcr.io > winter-cab-337613 > py-app

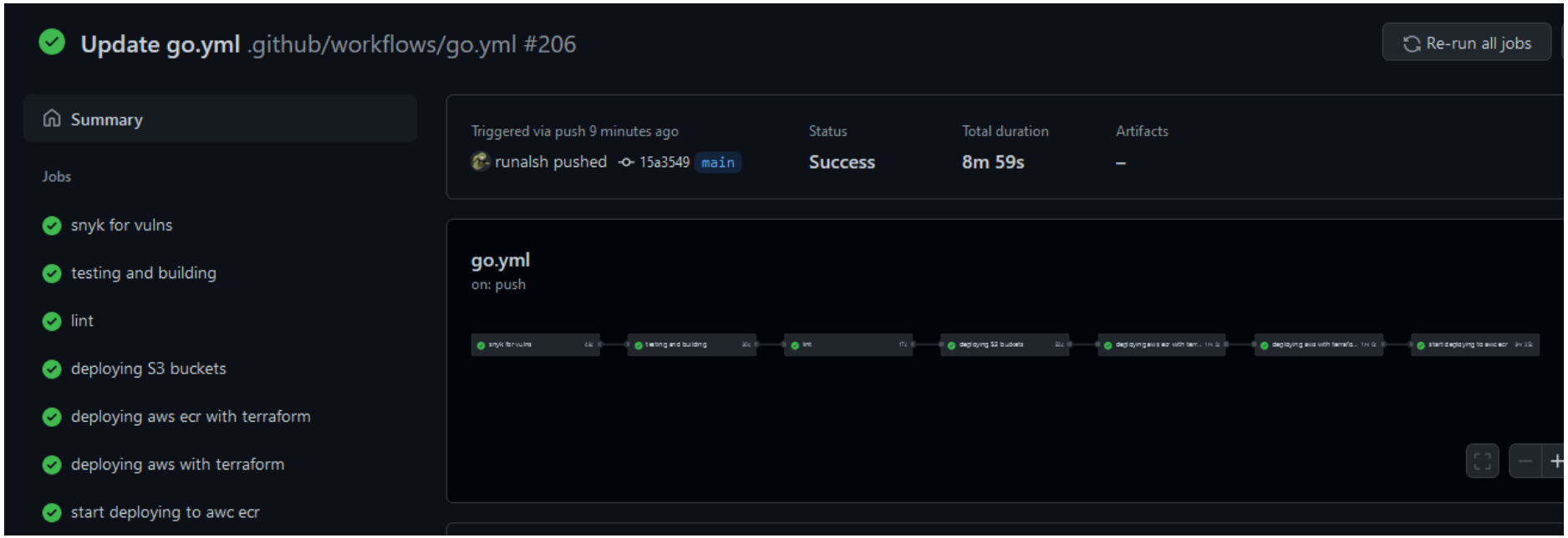
Filter Enter property name or value

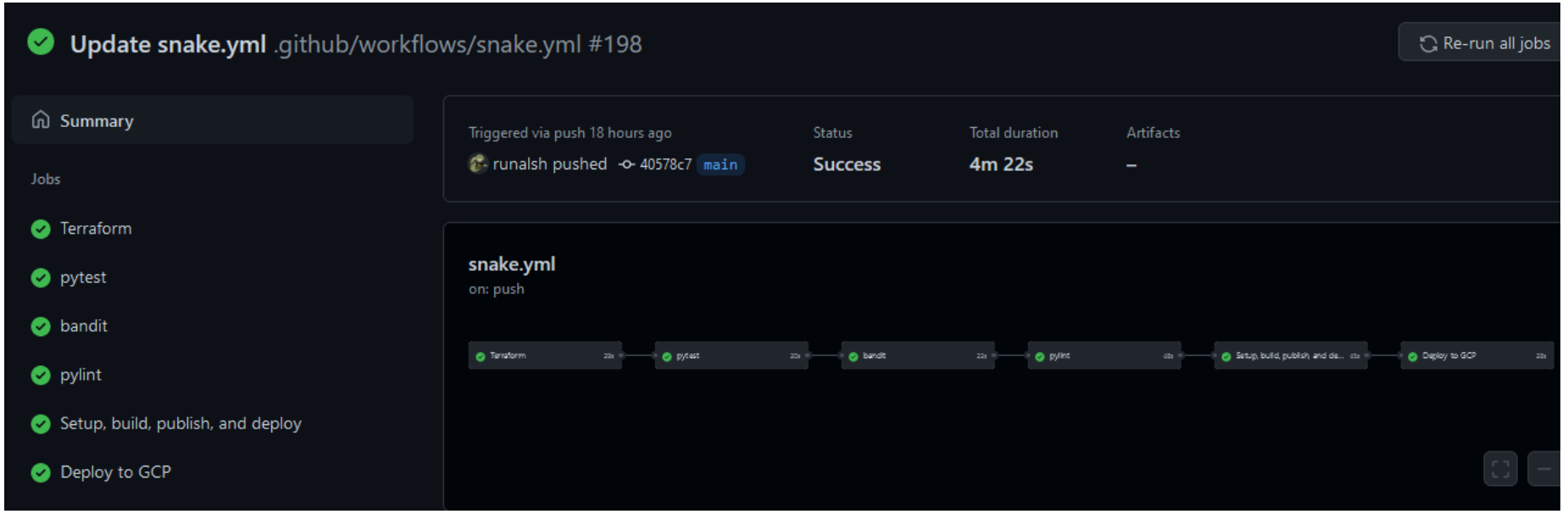
Name	Tags	Virtual Size
f4ebaf70c9fe	latest	16.1 MB
434514de9437		16.1 MB
295fde3ab94d		16.1 MB
e72d4809b97a		16.1 MB
a61bc5fdc8ab		16.1 MB
1bc8d8832685		16.1 MB



GITHUB ACTION





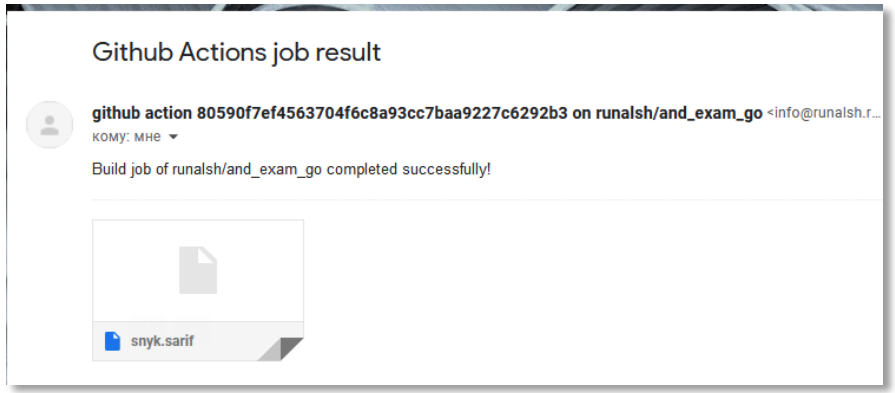


NOTIFICATIONS

runalsh created commit:
Commit message: Update go.yml
Repository commit:
https://github.com/runalsh/and_exam_go/commit/95f9f7f7fa57a43686709aef8ea62633c083fd7c
Result: deployaws job in worflow .github/workflows/go.yml of runalsh/and_exam_go has success
Action: Deploy AWS infrastructure with Terraform
Status: success
13:19

runalsh created commit:
Commit message: Update go.yml
Repository commit:
https://github.com/runalsh/and_exam_go/commit/95f9f7f7fa57a43686709aef8ea62633c083fd7c
Result: pushtoecr job in worflow .github/workflows/go.yml of runalsh/and_exam_go has success
Action: Push image to AWS ECS and update tasks in cluster
Status: success
13:21

runalsh created commit:
Commit message: Update imcat.tf
Repository commit:
https://github.com/runalsh/and_exam_go/commit/1a4f4bee2b47aa35aff06757d33b63348c763e21
Result: deployaws job in worflow .github/workflows/go.yml of runalsh/and_exam_go has failure
Action: Deploy AWS infrastructure with Terraform
Status: failure
12:51



github action 8adef8e919838c01d485784203c6b1b419c06aaf on runalsh/and_exam_go <info@runalsh.ru>
кому: мне

test job of runalsh/and_exam_go completed successfully!

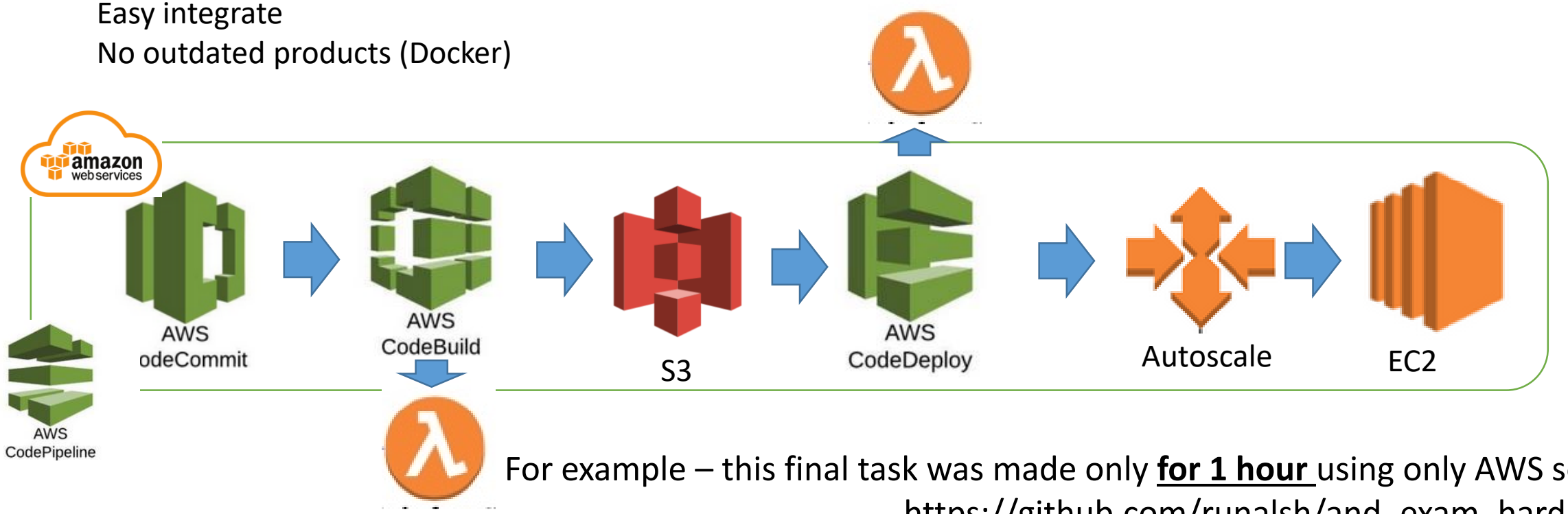
Ответить Переслать

IDEAL CI\CD

One service for all – development + integration + deployment
Version control - Blue\green versioning
Automatic rollback on failure
Easy to understand and visualize
User\new developer friendly
Easy integrate
No outdated products (Docker)

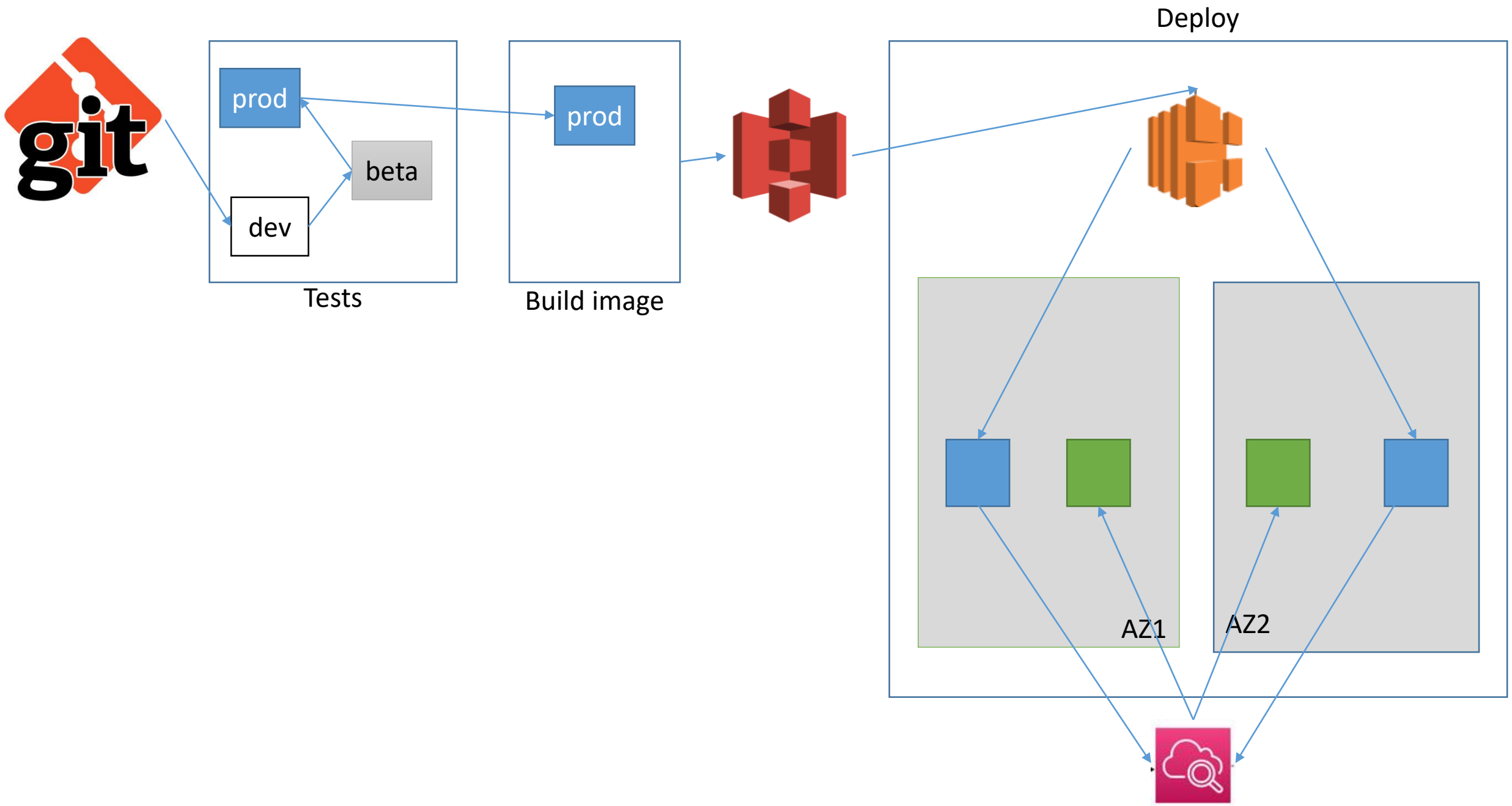
Can be extremely high cost

Fully depends on one service



For example – this final task was made only **for 1 hour** using only AWS services.
https://github.com/runalsh/and_exam_hardawstest

but if need some cheaper then…


Deploy
prod
beta
dev
Tests
prod
Build image
AZ1
AZ2

TODO or need to complete

problems	what need	approx time (h)	difficult
the most of Terraform files don’t use variables		2-3	easy
few problems with propagate variables from GA throw tf to k8s	idn, need more examples and docs	2	middle
split TF files	no	0,2	elementary
typos in comment/vars		0,2	elementary
remove unused or outdated code		0,2	elementary
put Load Balance external ips to Cloudflare DNS A record on deploy via CF API		0,6	easy
add https sec to LB external connections with Lets Encrypt/ built in or CF		2/0,2	middle/elementary
Dev/prod revisions git or blue\green on development		3-4	middle
Log store - stash (ELK), automate deploy on nodes		2	easy

QA

1. Are you working with devops tools like tf k8s etc before start courses?

No , just working with clouds for personal projects and some experience with docker\containerd

2. Why not used one cloud provider for both project?

Not interesting and not described in task (:

3. How you will run py app in AWS Cloud / go app in GCP?

PY on AWS – get taskdefinition, change image , add py docker image build , modify tf , create new service or may be cluster in AWS ECS Fragate (EC2) without changing infrastructure. Of course not as second infrastructure.
Second solution – build multistage container and run as-is. Add LB to each ports.
GO on GCP – may be push new docker image and build second kubernetis GKE… Or multistage container ofc.

4. Why project not fully ready? Why have incompleted todo list?

Don’t have enough time because made all project abroad Russia. I asked for give me final task in second half of december but don’t get response. Tryed to focus on main tasks.

5. What do you think the most difficult to make?

For long time cant find solution how force task update with latest image from ECR. Have problems with update existing infrastructure without destroy (hello tfstate). Some problems with Roles in AWS