

KUBERNETES IS HARD!

**LESSONS LEARNED TAKING OUR APPS TO
KUBERNETES**

WHY?

- ❁ Environment flexibility
 - ❁ Developer, QA, Support, Product, Solution... anyone!
- ❁ Per branch CI/CD
- ❁ Save money and resources
- ❁ Dogfooding

THE END

- 🌀 Take it easy
- 🌀 Your app is not ready
- 🌀 Limits are good (my mom said that)
- 🌀 Probes
- 🌀 Observability
- 🌀 Community

BARUCH SADOGURSKY

CHIEF STICKER OFFICER

(ALSO, HEAD OF DEVELOPER RELATIONS)



JBARUCH@JFROG.COM



@JBARUCH



+1(408)890-9281



EMOTIONALLY EXPRESSIVE



Israel
France

Spain

Italy

U.S.

Brazil

India
Mexico

Saudi Arabia

Philippines

CONFRONTATIONAL

AVOIDS CONFRONTATION

Netherlands

Germany

Denmark

U.K.

Sweden

Korea

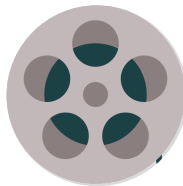
Japan

EMOTIONALLY UNEXPRESSIVE

SHOWNOTES



Slides



Video



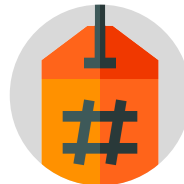
Links



Comments



Ratings



Raffle!

<https://jfrog.com/shownotes>

@jbaruch

#DevDialogue

#k8S

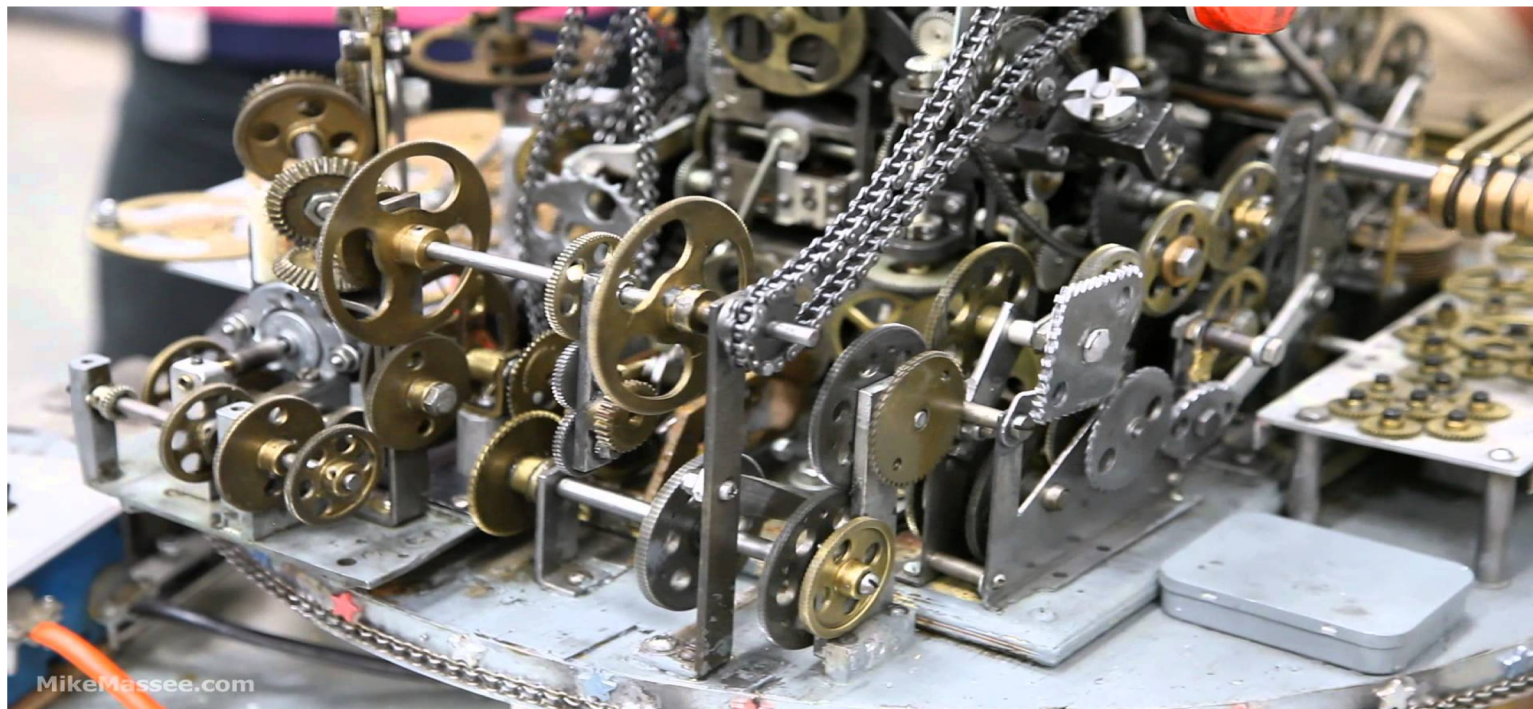
<http://jfrog.com/shownotes>

WHAT I'VE BEEN PROMISED



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WHAT IS IT IN REAL LIFE



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Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.



What's Draft?

Docs



Streamlined Kubernetes Development

Simple app development & deployment - into any Kubernetes cluster.



<> Code

! Issues 133

🔗 Pull requests 25

📁 Projects 3

📖 Wiki

🛡 Security

📊 Insights

Branch: master ▾

draft / packs /

Create new file

Upload files

Find file

History



bjornmagnusson Packs: update javascript to node:10

Latest commit a5882ef on Feb 13

..

📁 clojure	Updated Dockerfile to non-onbuild base images	a year ago
📁 csharp	Update Dockerfile	a year ago
📁 erlang	add erlang pack and example	a year ago
📁 go	Updated dockerfiles with build steps needed when not using onbuild	a year ago
📁 gradle	Packs: upgraded to jdk11	7 months ago
📁 java	Packs: upgraded to jdk11	7 months ago
📁 javascript	Packs: update javascript to node:10	3 months ago
📁 php	ref(packs): change default replicaCount to 1	a year ago
📁 python	Updated dockerfiles with build steps needed when not using onbuild	a year ago
📁 ruby	Updated dockerfiles with build steps needed when not using onbuild	a year ago
📁 rust	ref(packs): change default replicaCount to 1	a year ago
📁 swift	ref(packs): change default replicaCount to 1	a year ago
📄 README.md	rename chart/ to charts/	2 years ago

YOUR APP IS NOT READY.

FROM ANY “LOGGING BEST PRACTICES” TALK OR ARTICLE:



Before we wrap up, let's have a look at the main points that you should avoid – and that is using standard out instead of logging.

While `System.out()` can be a quick way to start very early on in the development cycle, it's definitely not a good practice to follow at that point.

Besides the fact that you lose all the powerful features of a dedicated logging API, this primary downside here is simply the fact that the output won't be persisted anywhere.

YOUR APP IS NOT READY

Data Persistency

-  You need it.
-  Or do you?



YOUR APP IS NOT READY

High availability

-  If you did HA before K8S, you are going to rewrite it

Scaling

-  Up and down

Updates and downgrades

-  Some pods will be newer than others (or older)

THE TWELVE FACTORS

I. Codebase

One codebase tracked in revision control, many deploys

II. Dependencies

Explicitly declare and isolate dependencies

III. Config

Store config in the environment

IV. Backing services

Treat backing services as attached resources

V. Build, release, run

Strictly separate build and run stages

VI. Processes

Execute the app as one or more stateless processes

VII. Port binding

Export services via port binding

VIII. Concurrency

Scale out via the process model

IX. Disposability

Maximize robustness with fast startup and graceful shutdown

X. Dev/prod parity

Keep development, staging, and production as similar as possible

XI. Logs

Treat logs as event streams

XII. Admin processes

Run admin/management tasks as one-off processes

NOW LET'S LOOK AT KUBERNETES

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LIMIT EVERYTHING

- ⚙ Always limit everything
- ⚙ Coordinate with applications limits
 - ⚙ Java
 - ⚙ `-Xms=1g -Xmx=2g`
 - ⚙ RabbitMQ
 - ⚙ `[rabbitmq.conf]`
 - `total_memory_available_override_value = 1GB`
 - ⚙ MongoDB
 - ⚙ `--wiredTigerCacheSizeGB=1`

```
...
resources:
  requests:
    memory: "1Gi"
    cpu: "100m"
  limits:
    memory: "2Gi"
    cpu: "250m"
...
```

TAKE CARE OF THE HEALTH

- ⚙️ It's always a good idea, mandatory with K8S
 - ⚙️ readinessProbe
 - ⚙️ When the app is ready to serve
 - ⚙️ livenessProbe
 - ⚙️ Is this thing alive?
- ⚙️ Probe types
 - ⚙️ Exec - returns 0
 - ⚙️ Http - returns < 400
 - ⚙️ Tcp - did we manage to open a port
- ⚙️ If needed, write an exec script

```
...
readinessProbe:
  httpGet:
    path: /api/system/health
    port: 8080
...
livenessProbe:
  exec:
    command:
      - mongo
      - --eval
      - "db.adminCommand('ping')"
...
livenessProbe:
  tcpSocket:
    port: 5672
...
```

MORE THAN ONE CONTAINER IN A POD

⚙ Initialization (before your container is up)

- ⚙ Preheat your cache

- ⚙ Run config scripts

⚙ Sidecar design pattern

- ⚙ Log collector

- ⚙ Monitoring

- ⚙ Network proxy (e.g. Istio)



HOW TO DEPLOY ANYTHING TO K8S

 Copy YAML

 Paste YAML

 Fix indents

 Repeat

KUBERNETES RESOURCE

```
{
  "kind": "Deployment",
  "apiVersion": "extensions/v1beta1",
  "metadata": {
    "name": "my-release-docker-app-chart"
  },
  "spec": {
    "containers": [
      {
        "name": "docker-app-chart",
        "image": "docker.artifactory/docker-app:1.0",
```

LET'S BUILD A NEW ONE!

```
> docker build -t docker.artifactory/docker-app:1.1
```

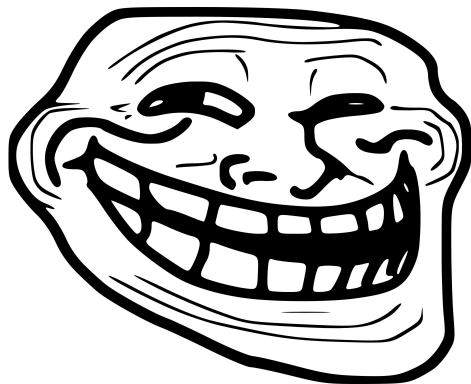

ONE LAST THING...

```
> sed -i.bak  
`s#docker.artifactory/docker-app:1.1#${imageTag}#`  
deployment.yaml
```



OR JUST USE :LATEST

```
"image": "docker.artifactory/docker-app:latest"
```



ENTER HELM

ENCAPSULATED PACKAGES OF KUBERNETES DEPLOYMENTS

All this...

xray
xray-analysis
xray-event
xray-indexer
xray-nfs-server
xray-persist

Becomes this

xray

POWERFUL TEMPLATING FOR DESCRIPTOR FILES

```
{
  "kind": "Deployment",
  "apiVersion": "extensions/v1beta1",
  "metadata": {
    "name": "{{ template \"docker-app.fullname\" . }}"
  },
  "spec": {
    "containers": [
      {
        "name": "{{ template \"docker-app.name\" . }}",
        "image": "{{ .Values.image.repository }}:
                {{ .Values.image.tag }}"
      }
    ]
  }
}
```

VALUES:

*# Default values for docker-app.
This is a YAML-formatted file.
Declare name/value pairs to be passed into your templates.*

image:

repository: docker.artifactory/docker-app

tag: 1.1

secretName: regsecret

pullPolicy: Always

SIMPLE!

🔗 Templates

🔗 Values

🔗 Metadata

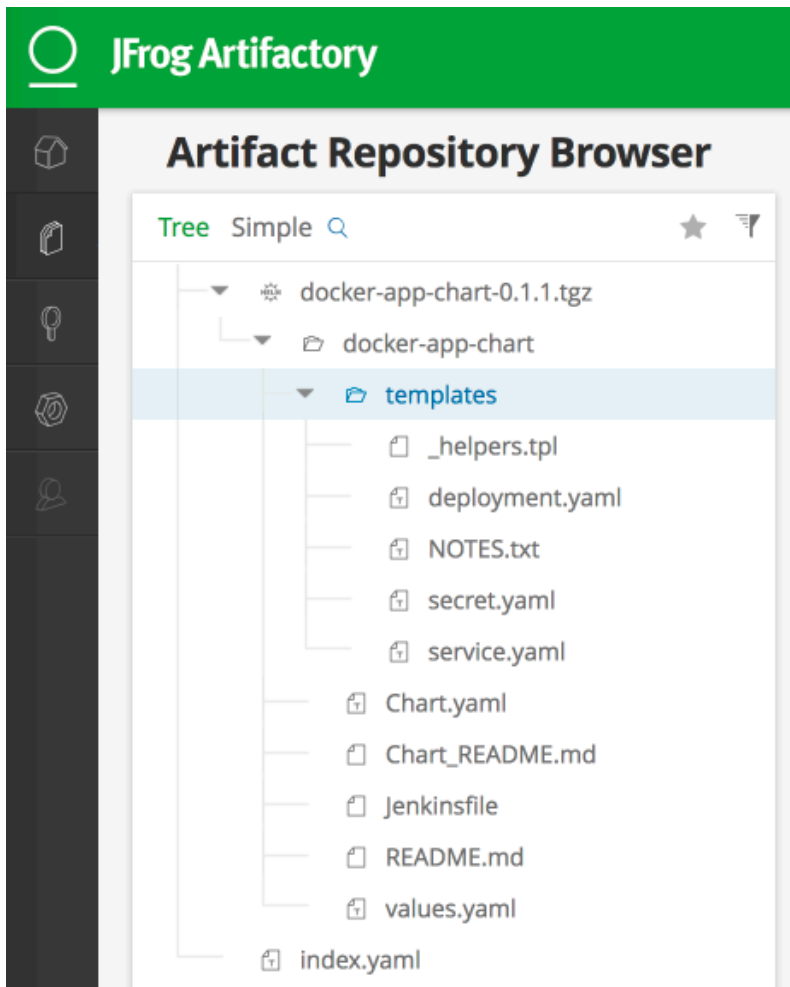


CHART <-> IMAGE RELATIONSHIP

- ⚙ Using templates we can reuse charts for multiple image versions
- ⚙ Chart versions != Image versions

Discover & launch great
Kubernetes-ready apps

Search charts...

159 charts ready to deploy



acs-engine-autoscaler

2.1.1 **stable** ☆ 0



aerospike

v3.14.1.2 **stable** ☆ 0

anchore

anchore-engine

0.1.6 **stable** ☆ 0



artifactory

5.8.3 **stable** ☆ 17



buildkite

3 **stable** ☆ 1



burrow

0.17.1 **incubator** ☆ 0



cassandra

incubator ☆ 3



centrifugo

1.7.3 **stable** ☆ 0

HELM REPOSITORIES

- ❁ Official repository - kubeapps.com
- ❁ Get a local one!
- ❁ Option 1: Create your own:
 - ❁ Run an http server with index.yaml
 - ❁ Run helm repo index to generate one the index
- ❁ Option 2: Use JFrog Artifactory
 - ❁ Universal Artifact Repository which supports Docker, Helm and everything else
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OBSERVABILITY

- ❁ No more ssh and grep in logs
- ❁ No need for production access for everybody (unless you pretend you're Netflix)
- ❁ Observability tools:
 - ❁ Log aggregation (Sumo Logic, Splunk, Log Entries)
 - ❁ APM (New Relic, AppDynamics)
 - ❁ Monitoring (DataDog, SignalFX)
- ❁ Cloud-Native tools

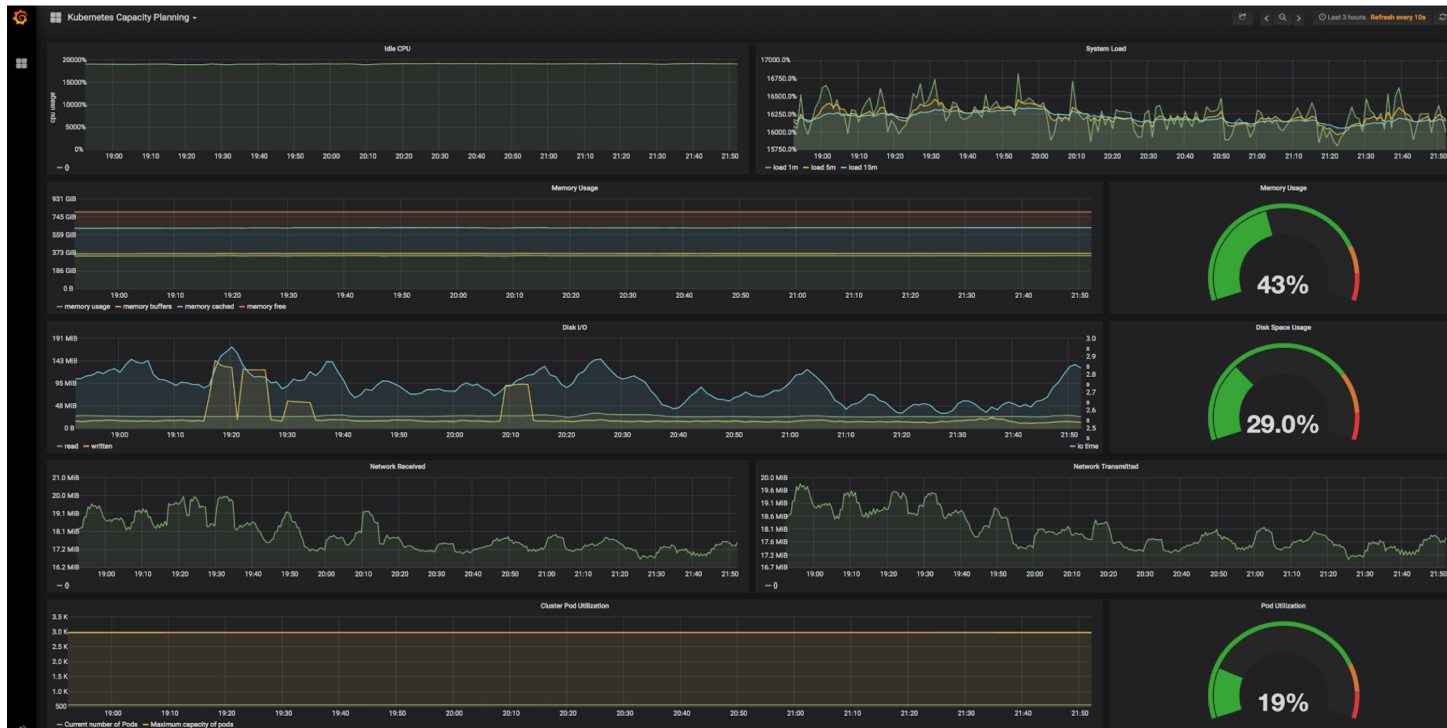
CLOUD-NATIVE OBSERVABILITY - MONITORING



Prometheus



Grafana



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CLOUD-NATIVE OBSERVABILITY - LOGS



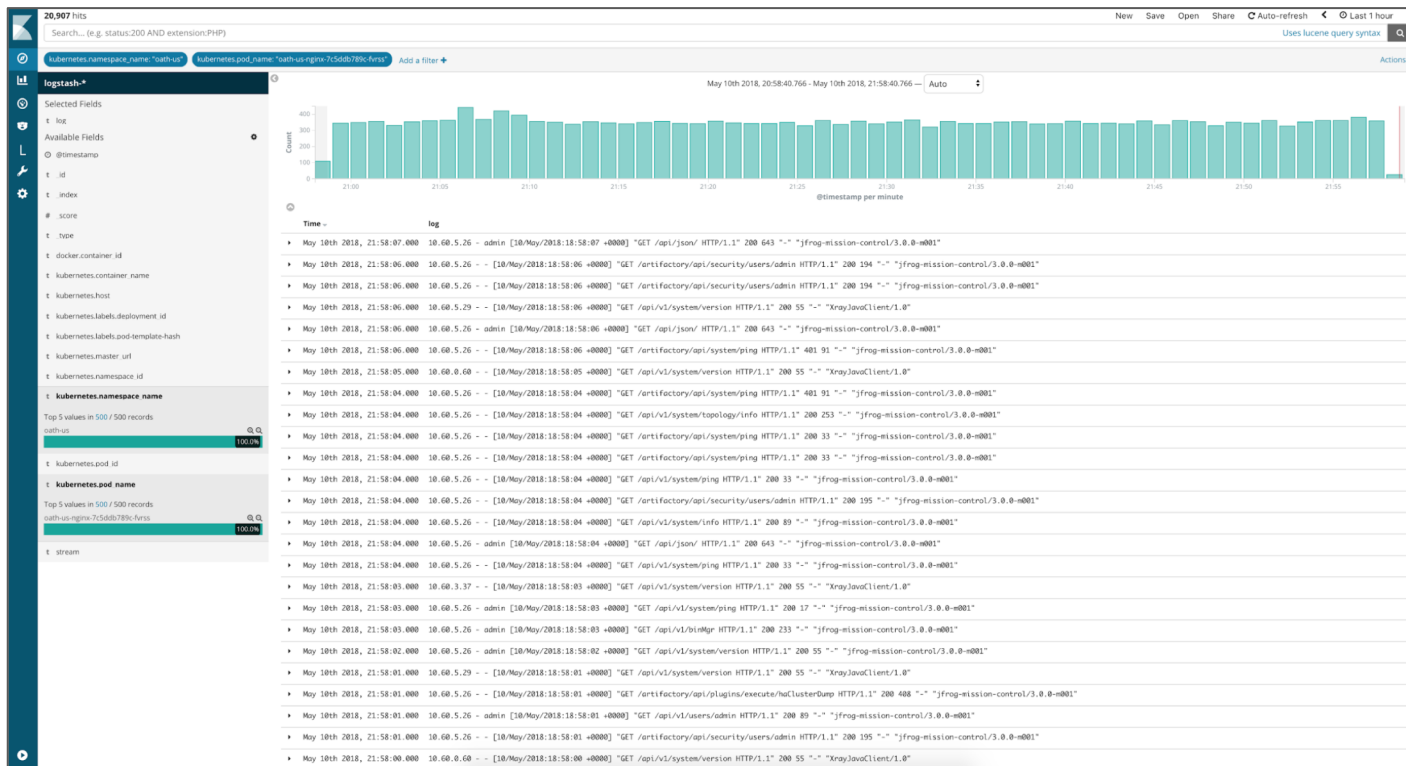
Fluentd



ElasticSearch



Kibana



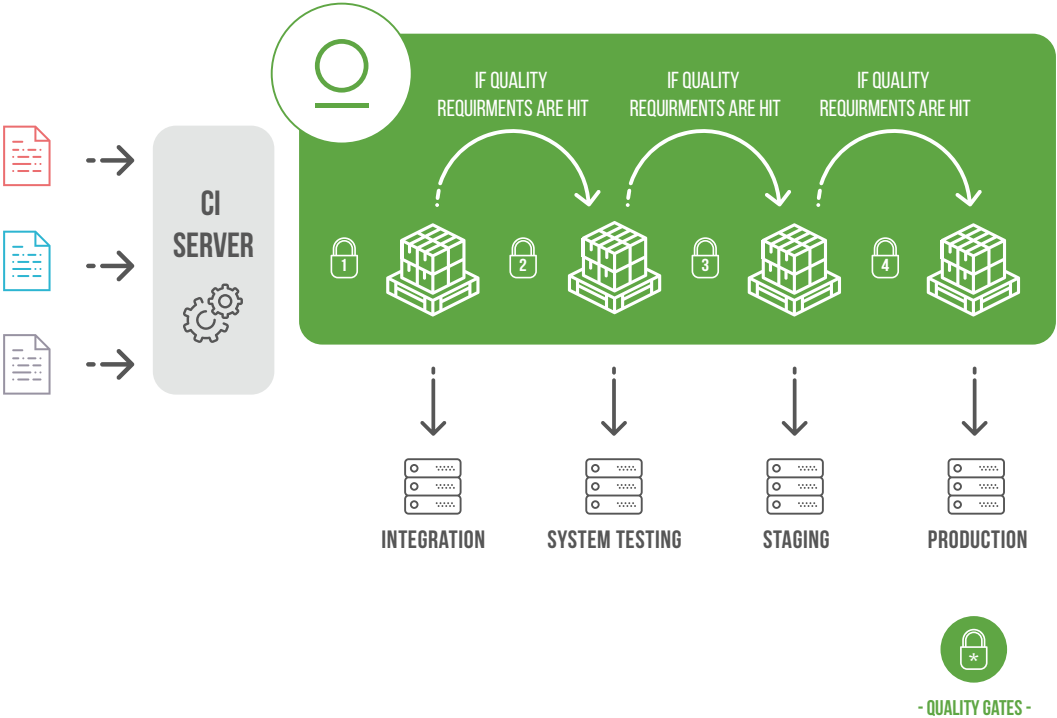
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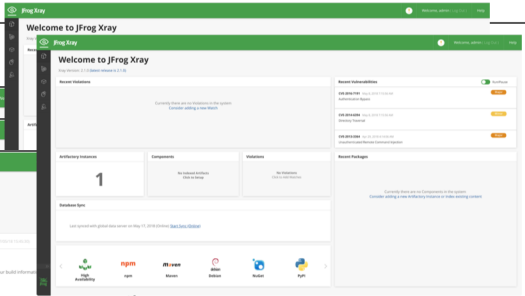
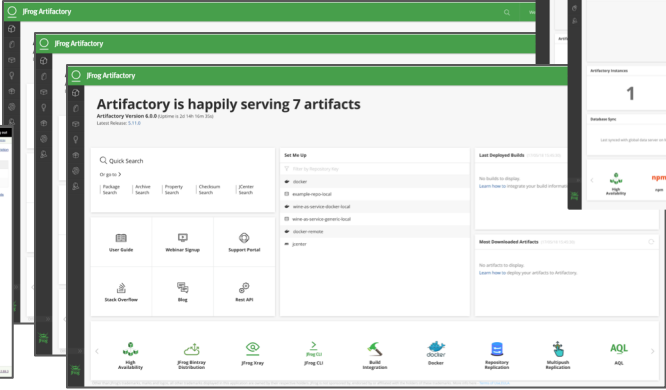
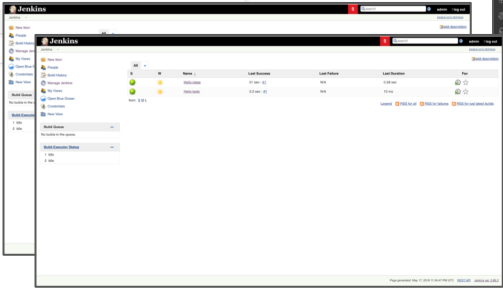
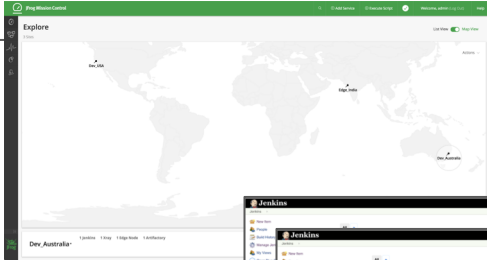
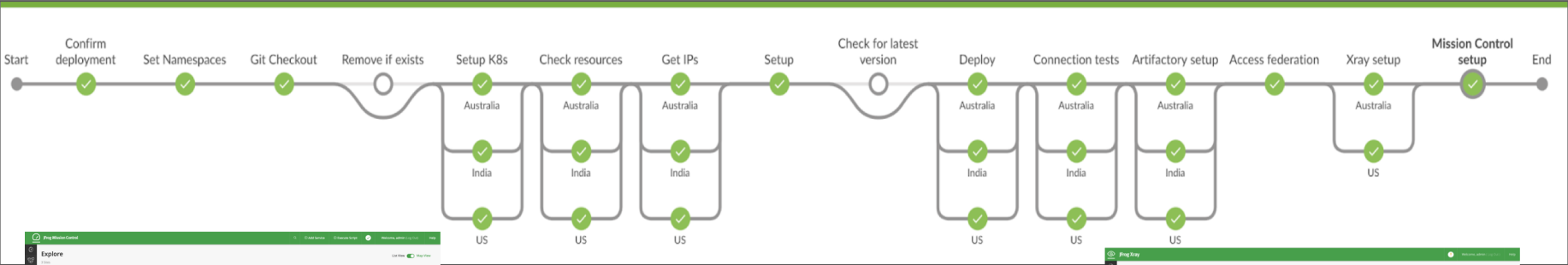
#k8S

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WE'RE BIG ON THOSE PIPELINES AND PROMOTIONS CONCEPTS



INTEGRATION WITH CI SERVERS



JFROG AND K8S

- ❁ GoCenter.io
- ❁ Distribution
- ❁ Development, testing

COMMUNITY

- 🐳 Probably someone had this problem before
- 🐳 CNCF Ambassadors
- 🐳 Project maintainers and committers
- 🐳 Kudos
 - 🐳 RabbitMQ HA
 - 🐳 MongoDB (Bitnami)

THE END

- 🌀 Take it easy
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TWITTER ADS AND Q&A

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HAPPY SAILING!



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