



QUANTLANE

Python, Docker, Kubernetes, and beyond?

Peter Bábits | EuroPython 2018

July 25, 2018



QUANTLANE

- Based in Prague
- Small team of developers
- Developing a trading platform and strategies
- Using open source

Our trading platform and tooling

- Python 3.6 + React.js
- asyncio
- Redis & TimescaleDB for storage
- Integrating third party libraries using Cython
- Dozens of processes
- Messaging - Kafka / RabbitMQ

In the beginning

There was chaos

In the beginning

- Applications deployed on physical servers
- Managed by `circus`
- Packages installed in `virtualenv`
- Under a single user

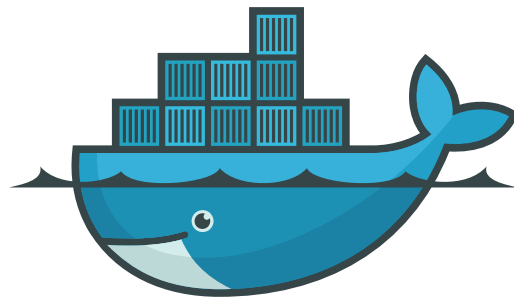
Pros

- Simple implementation and deployment

Cons

- Package versioning hell
- No failover

A wild blue whale appeared



docker

The promise of a brighter future

- Unified environment
- Simple deployment
- Simple migrations
- Faster Continuous Integration (CI)
- Atomic releases

Migration challenges

- Image storage - GitLab registry
- Image caching
- Dedicated building environment

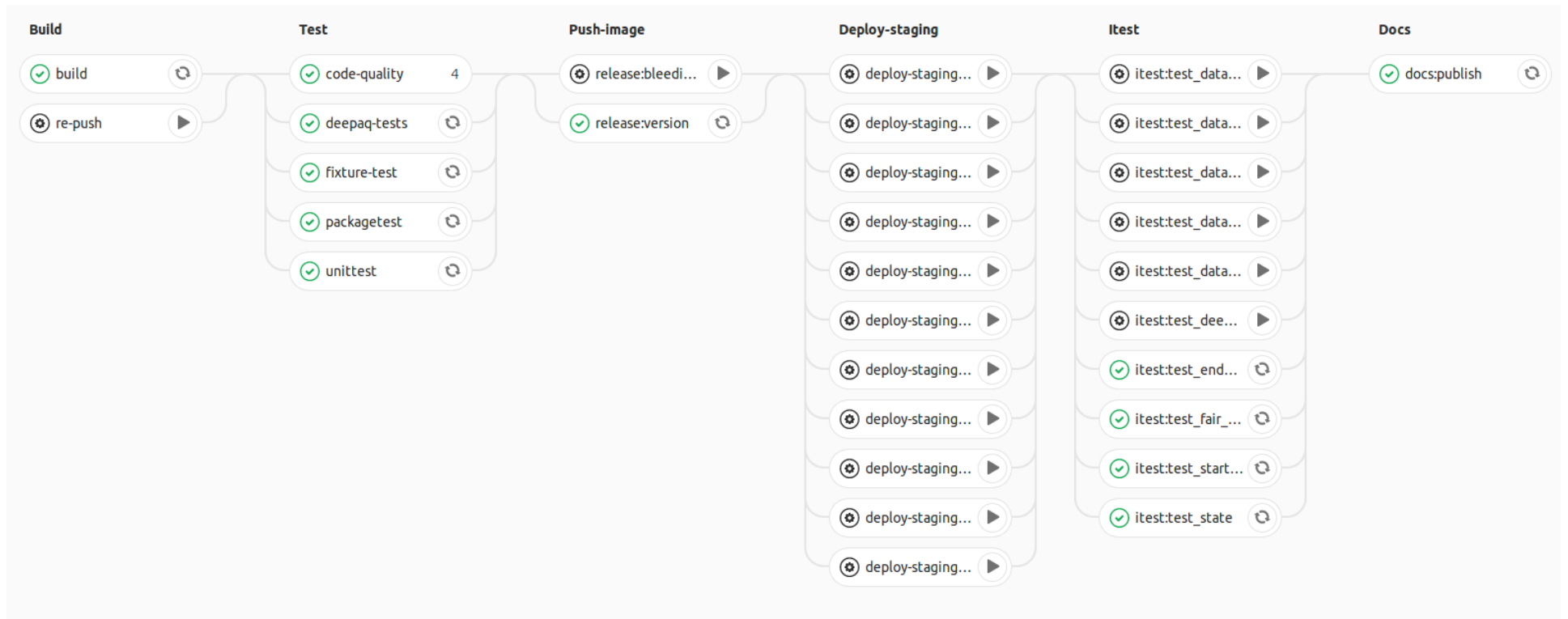
```
build_job:  
  script:  
    - docker build -t $CI_IMAGE_NAME .
```

```
build_job:  
  script:  
    - 'docker run -d -p 9000:9000 -v "/:/data" sleep 1y'
```

- CI pipeline design
- Cleaning up old images

Migration highlights

- Unified, stable environment
- Fast builds
- Isolated environments
- Faster CI pipeline



Cons of plain Docker

- Known bugs
- No failover
- dockerd is a single point of failure

Docker gotchas

- PID 1 pitfall
- User permissions within containers



kubernetes

Ahoy!

Warmly welcomed features

- Failover when a server fails
- Configuration stored in namespaces
- Service discovery

```
my-service.my-namespace.svc.cluster.local
```

- Ingress controller
- Deployment history

```
$ kubectl rollout undo deployment my-app
```

Where we are now

- Migration to Kubernetes is in progress
- Environment is configured by namespace variables
- Deployments are described in Jinja2 templates

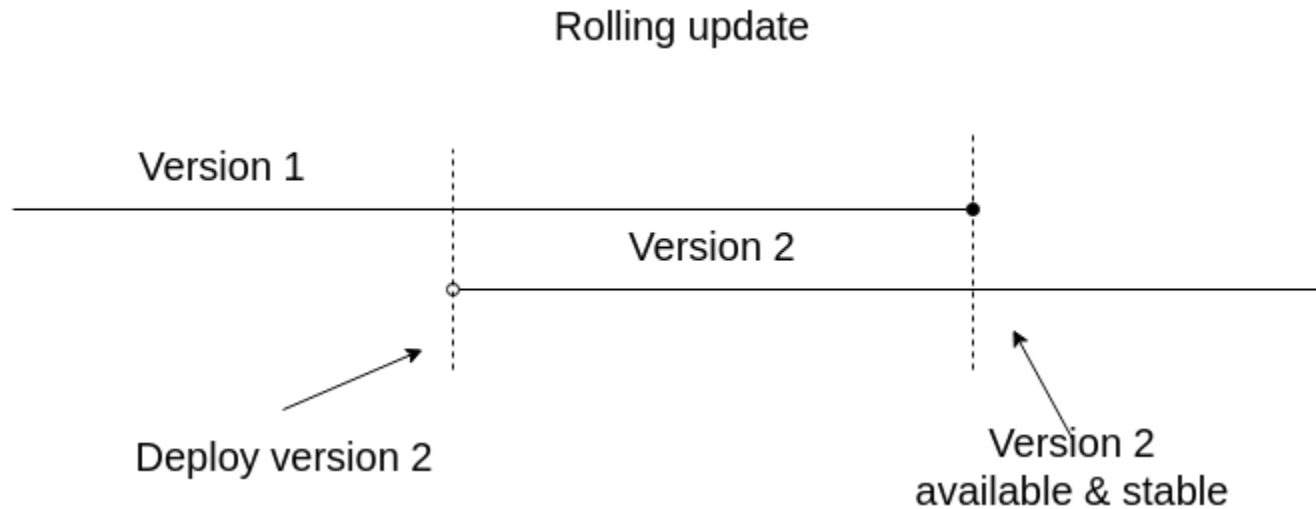
```
{% set env_type, profile_name = PROFILE.split('_', 1) %}
{% set namespace = "my-ns-" + env_type %}
{% set data_directory_mount = '/data' %}

{% if profile_name == 'cthulu' %}
  - name: API_KEY
    valueFrom:
      secretKeyRef:
        name: secret
        key: api_key
  - name: SUBSCRIPTION_INSTRUMENT_FILTER
    value: 'False'
{% endif %}
```

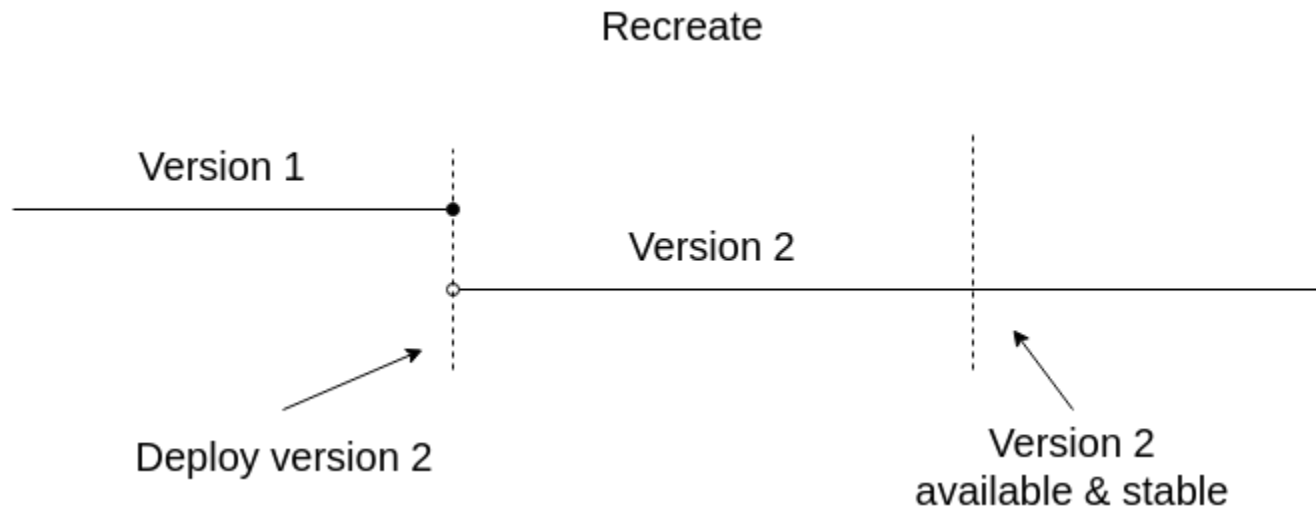

Notable features

- Probes
- Update strategies

Update strategies - Rolling update



Update strategies - Recreate





QUANTLANE

Thank you

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