



INDONESIA
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Scalable Jenkins on K8s

Distributed build with JNLP

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Certifications:



Certified Openstack Administrator



Certified Kubernetes Administrator

 Husni Alhamdani



In 2019...

\$ husni get logs

- **Talk: JK8s Meetup 05: Tips passing CKA certifications (Jakarta)**
May 2019
- **Scholarship LF Events: Helm Summit 2019 (Amsterdam)**
September 2019
- **Talk: Microservices with Kubernetes & Istio (Malaysia)**
October 2019
- **Scholarship LF Events: KubeCon 2019 (North America)**
this Month (18-22 November)

Agenda

- Jenkins overview
- Jenkins Master-Slave architecture
- Why we need to make it scalable?
- Setup on K8s
- Demo
- Summary



Overview #1



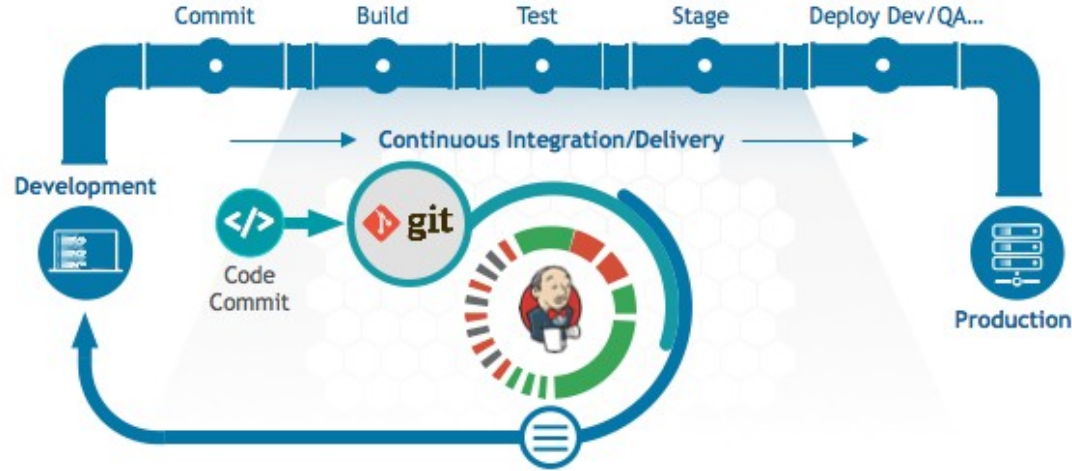
Jenkins

Jenkins is free and open sources automations server. Jenkins help to automatethe non-human part of the software development process,

With Continous Integration (CI) and Facilitating technical aspect of Continous delivery (CD).



Overview #2



Source image: CloudBees



Overview #3



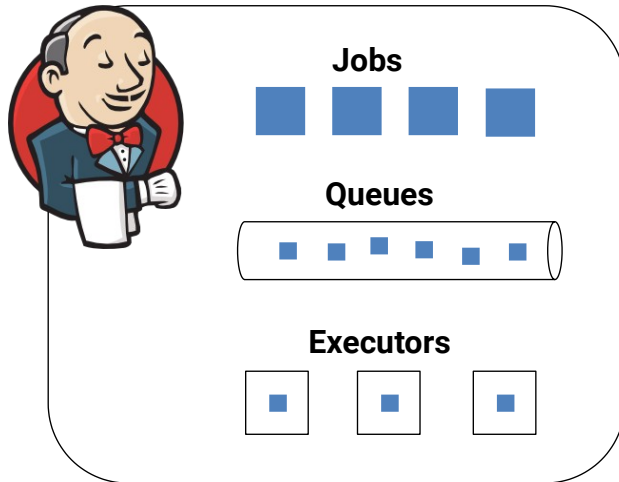
Jenkins

Some advantage of Jenkins:

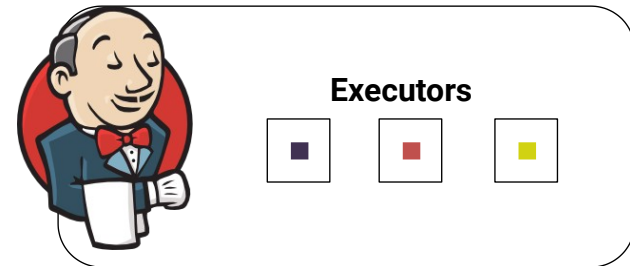
- Open-source software with extensive community support
- Java-based codebase, making it portable to all major platforms
- A rich ecosystem of more than 1000 plugins

Jenkins Master-slave architecture

Jenkins Master

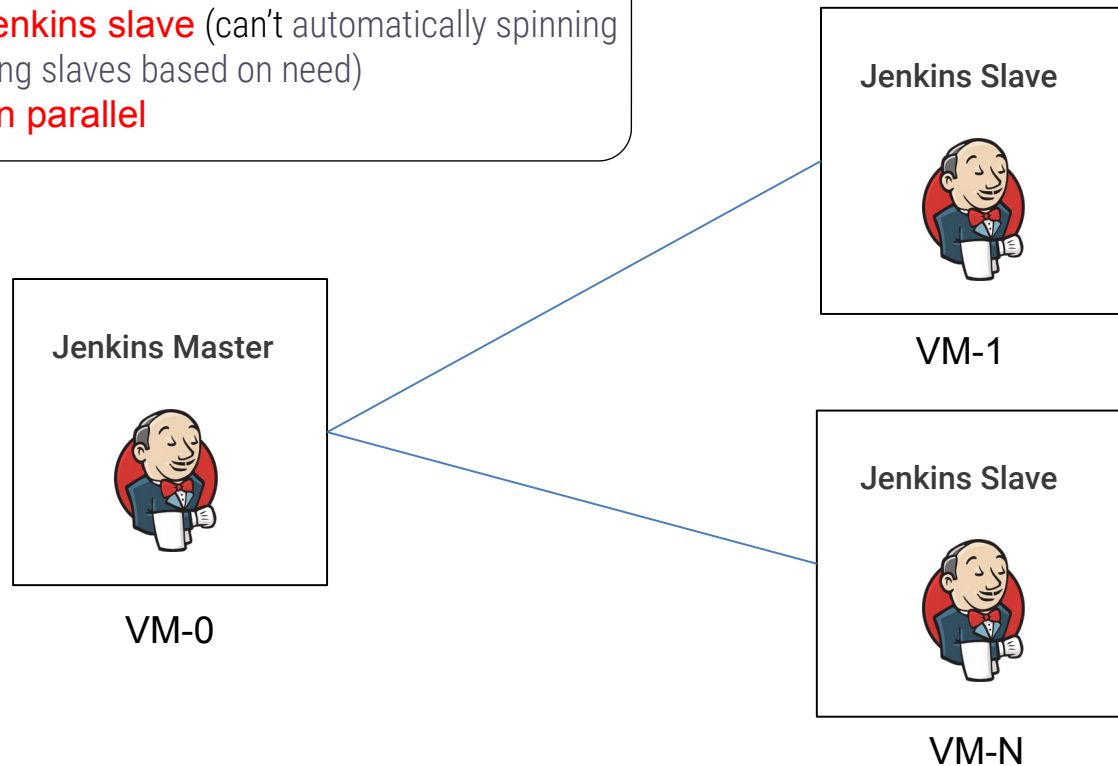


Jenkins Slave



But, The problem is...

- **Dedicated Jenkins slave** (can't automatically spinning up and removing slaves based on need)
- **Cannot run in parallel**

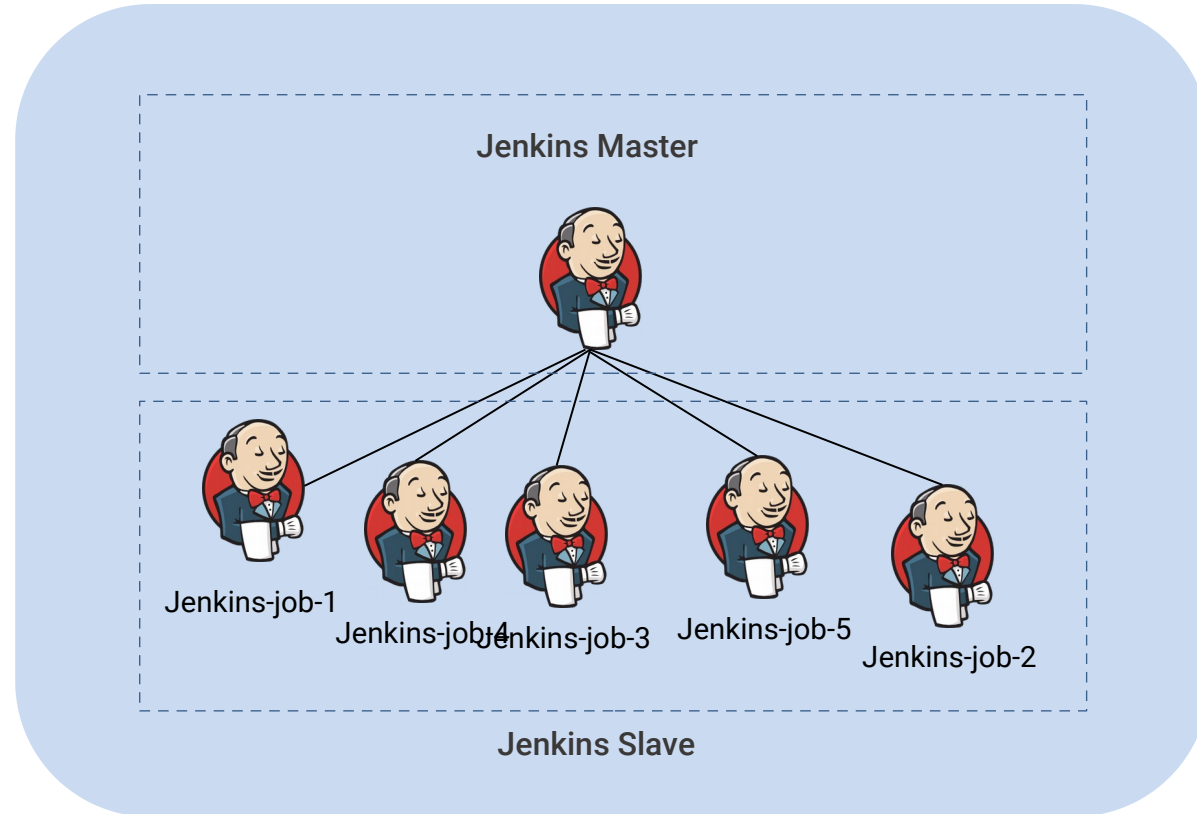


Scalable Jenkins on K8s?



Jenkins Job :

- Jenkins-job-1
- Jenkins-job-2
- Jenkins-job-3
- Jenkins-job-4
- Jenkins-job-5

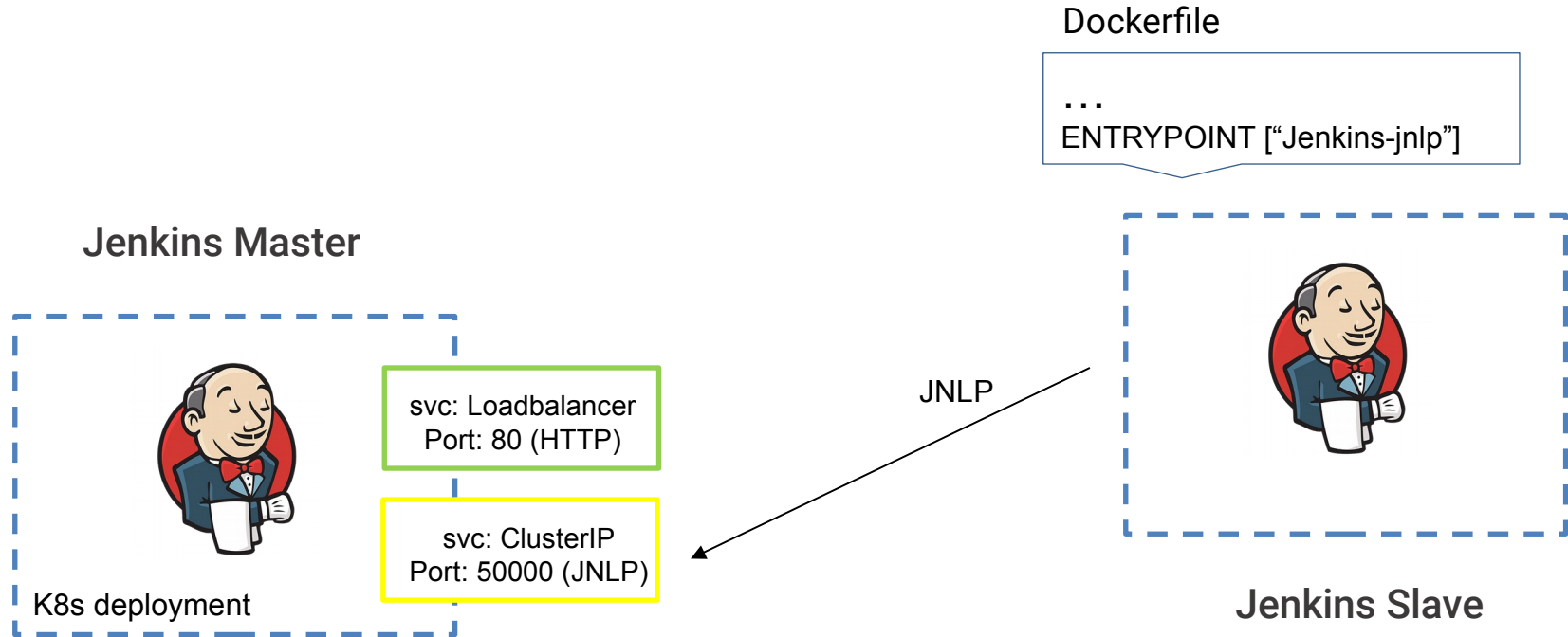


K8s Cluster

Setup scalable Jenkins on K8s

- Prepare/Modify Jenkins (Master-Slave) image
- K8s: Create Deployment (Jenkins Master)
- K8s: Create Services (HTTP, JNLP)
- Jenkins: Kubernetes Plugin
- Jenkins: Jenkins Slave configurations

Setup on K8s



Setup on K8s #1

Docker Image

jenkins/Jenkins:lts

Jenkins Master

jenkinsci/jnlp-slave

```
FROM jenkinsci/jnlp-slave
```

```
ENTRYPOINT ["jenkins-slave"]
```

Dockerfile

Jenkins Slave

Setup on K8s #2

K8s Deployment (Jenkins Master)

```
apiVersion: extensions/v1beta1
kind: Deployment
metadata:
  name: jenkins
spec:
  ....
containers:
  - name: jenkins
    image: Jenkins/Jenkins:its
    env:
      - name: JAVA_OPTS
        value: -Djenkins.install.runSetupWizard=false
    ports:
      - name: http-port
        containerPort: 8080
      - name: jnlp-port
        containerPort: 50000
```

Setup on K8s #3

K8s Services (Jenkins Master)

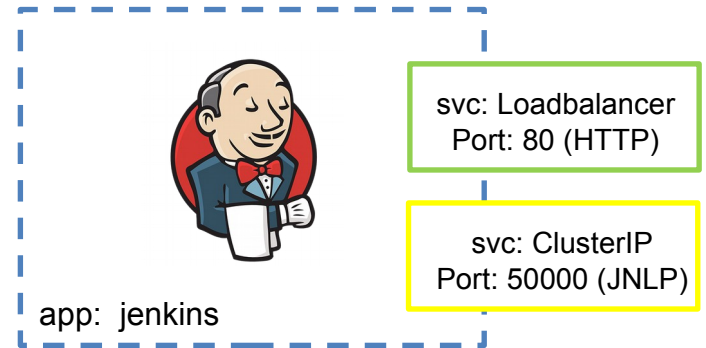
```
apiVersion: v1
kind: Service
metadata:
```

```
  name: jenkins
spec:
  type: LoadBalancer
  ports:
    - port: 80
      targetPort: 8080
  selector:
    app: jenkins
```

```
apiVersion: v1
kind: Service
metadata:
```

```
  name: Jenkins-jnlp
spec:
  type: ClusterIP
  ports:
    - port: 50000
      targetPort: 50000
  selector:
    app: jenkins
```

=



External (Jenkins UI)

Internal (Jenkins JNLP)

Setup on K8s #4

Jenkins: Kubernetes plugin integration

Jenkins > configuration

Kubernetes

Name

Kubernetes URL

Kubernetes server certificate key

Disable https certificate check

Kubernetes Namespace

Credentials

Connection test successful

Jenkins URL

Jenkins tunnel

Setup on K8s #5

Jenkins: Dynamic agent configuration (Jenkins Slave)

Images

Kubernetes Pod Template

Name

Namespace

Labels

Usage

The name of the pod template to inherit from

Containers

Container Template

Name

Docker image

Always pull image

Working directory

Command to run

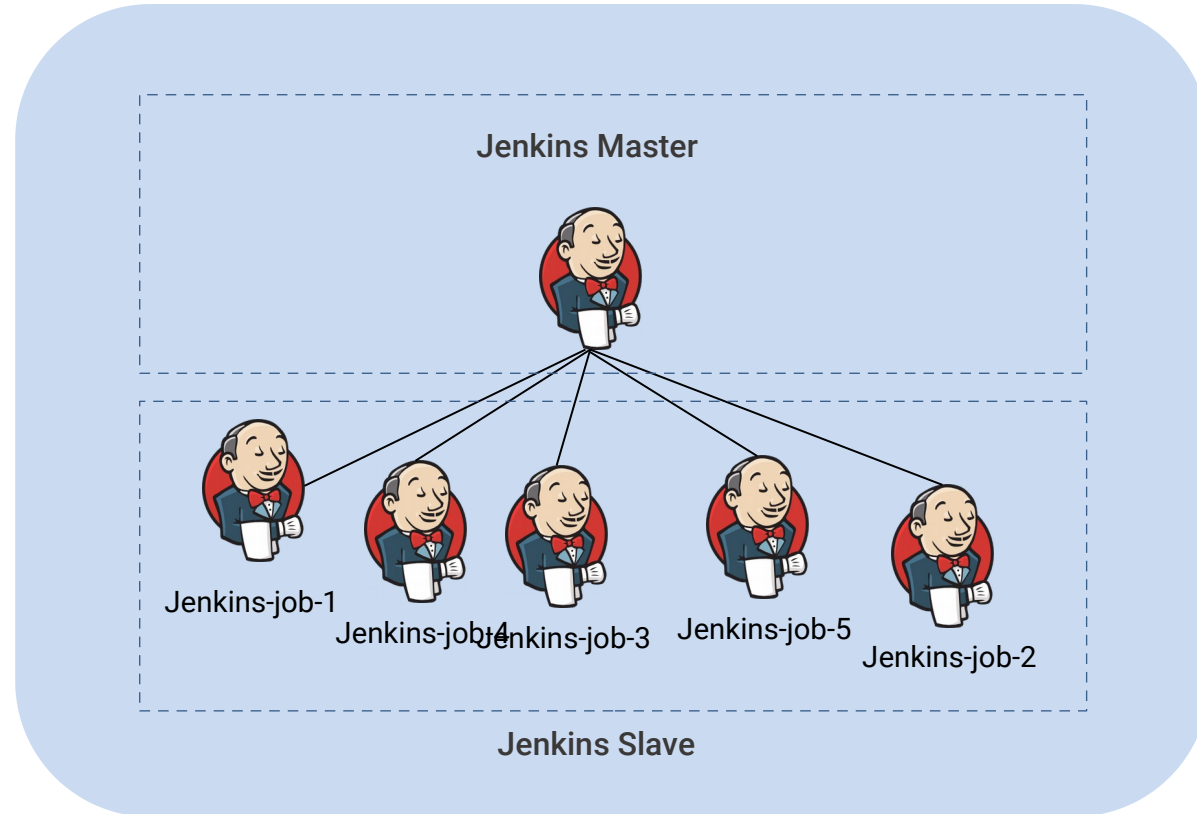
Arguments to pass to the command

Scalable Jenkins on K8s



Jenkins Job :

- Jenkins-job-1
- Jenkins-job-2
- Jenkins-job-3
- Jenkins-job-4
- Jenkins-job-5



Summary!!!

Without scalable

- **Cannot run in parallel**
- **Dedicated Jenkins slave** (can't automatically spinning up and removing slaves based on need)

With scalable

- the ability to run many more build plans in parallel
- automatically replacing corrupted Jenkins instances
- automatically spinning up and removing slaves based on need, which saves costs

Resources

[Github.com/husnialhamdani/scalable-jenkins-on-k8s](https://github.com/husnialhamdani/scalable-jenkins-on-k8s)

Thank you!

@HusniAlhamdani