

# Harbor integration with Kubernetes

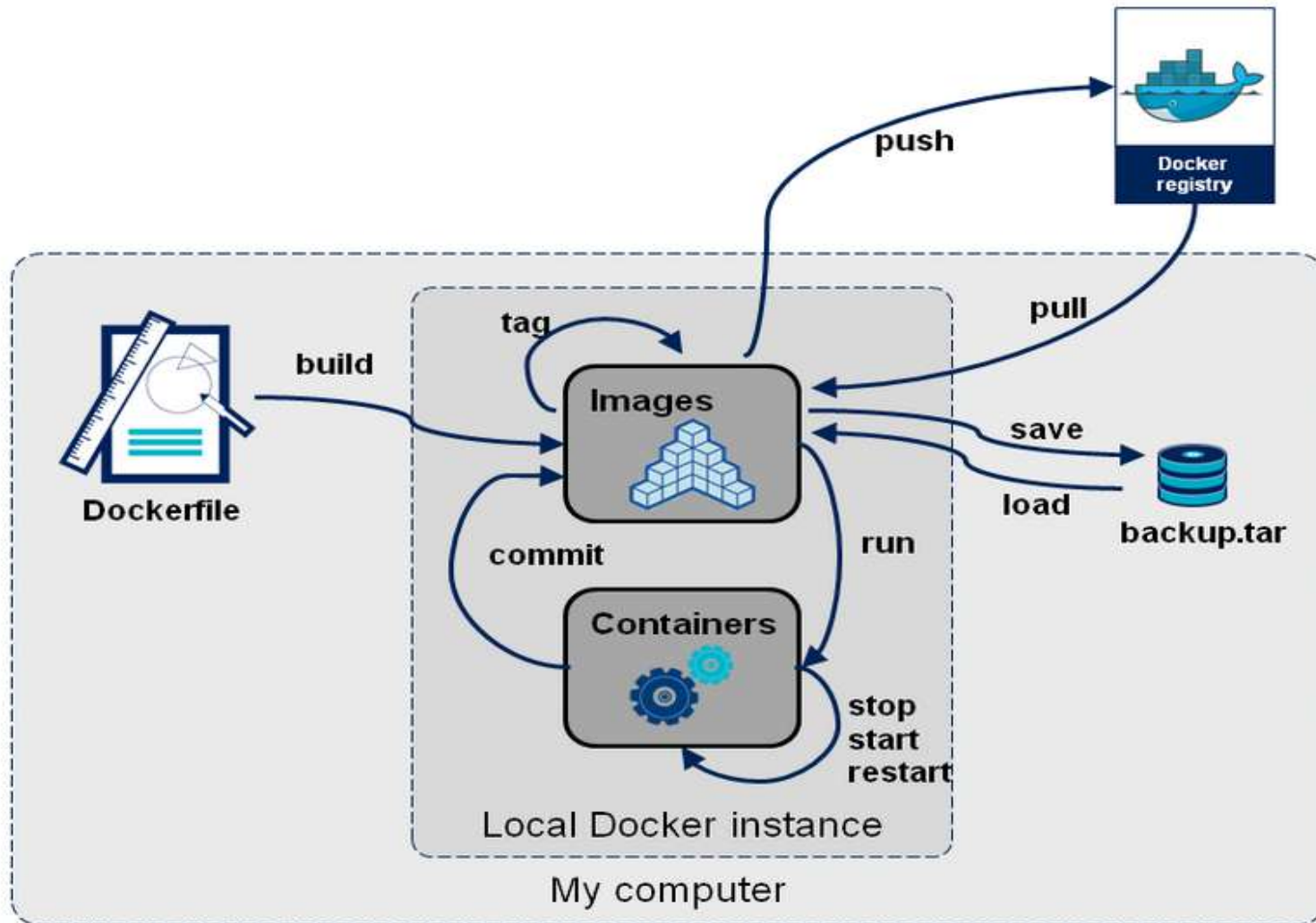
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# Introducing Project Harbor



- An open source enterprise-class registry server.
- Apache 2 license.
- Initiated by VMware China.
- To be developed and maintained by Chinese technology community.
- <https://github.com/vmware/harbor/>
- 0.3.0 released this week!

# What is a Registry?



# Why a private registry server?

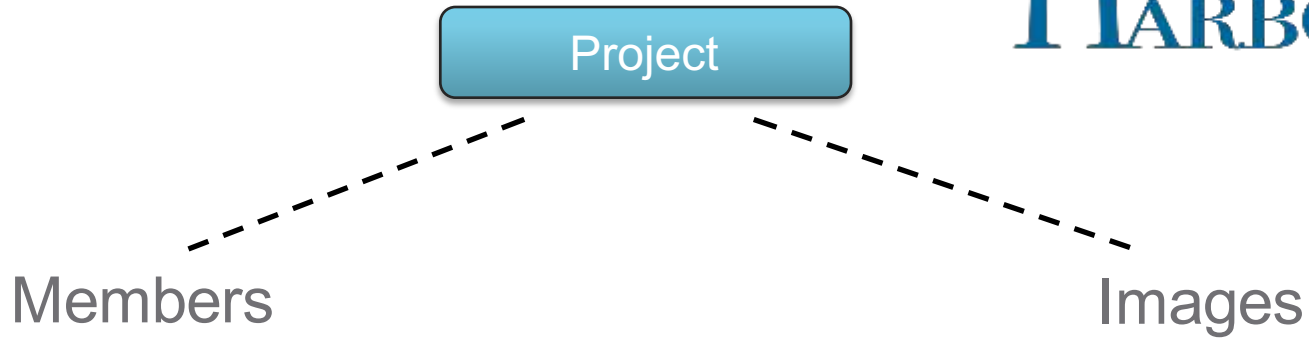
- Almost all container users set up their own private registry
- Efficiency
  - LAN vs WAN
  - Internet connection is the pain for Chinese users
- Security
  - Intellectual property stays in organization
  - Access Control
  - Integration with enterprise identity, such as AD/LDAP

# Key Features

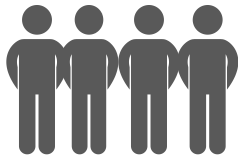


- Web Admin GUI *new in 0.3.0*
- User management & access control
  - User self-registration and password reset
  - AD/LDAP integration
  - RBAC, Project/repo granularity: admin, developer, guest
- Audit and logs
- Policy based image replication. *new in 0.3.0*
- Internationalization: 中文 and English
- Restful API for integration
- Easy deployment and customization with Docker compose

# Access Control



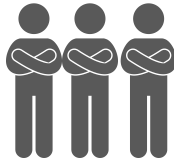
Guest:



docker pull ...

`${Project}/ubuntu:14.04`  
`${Project}/nginx:1.8, 1.9`  
`${Project}/golang:1.6.2`  
`${Project}/redis:3.0`

Developer:



docker pull/push ...

.....

Admin:



## My Projects | Public Projects

development ▾

[Repositories](#) | [Replication](#) | [Users](#) | [Logs](#)

development/hello-world <b>1</b>			
development/nginx <b>1</b>			
Tag	Image Details	Pull Command	Operation
1.9		<input type="text" value="docker pull 10.117.4.174/development/nginx:1.9"/>	
development/redis <b>1</b>			
Tag	Image Details	Pull Command	Operation
latest		<input type="text" value="docker pull 10.117.4.174/development/redis:latest"/>	



admin

Dashboard Projects Admin Options

Search projects or repositories

## My Projects | Public Projects

development ▾

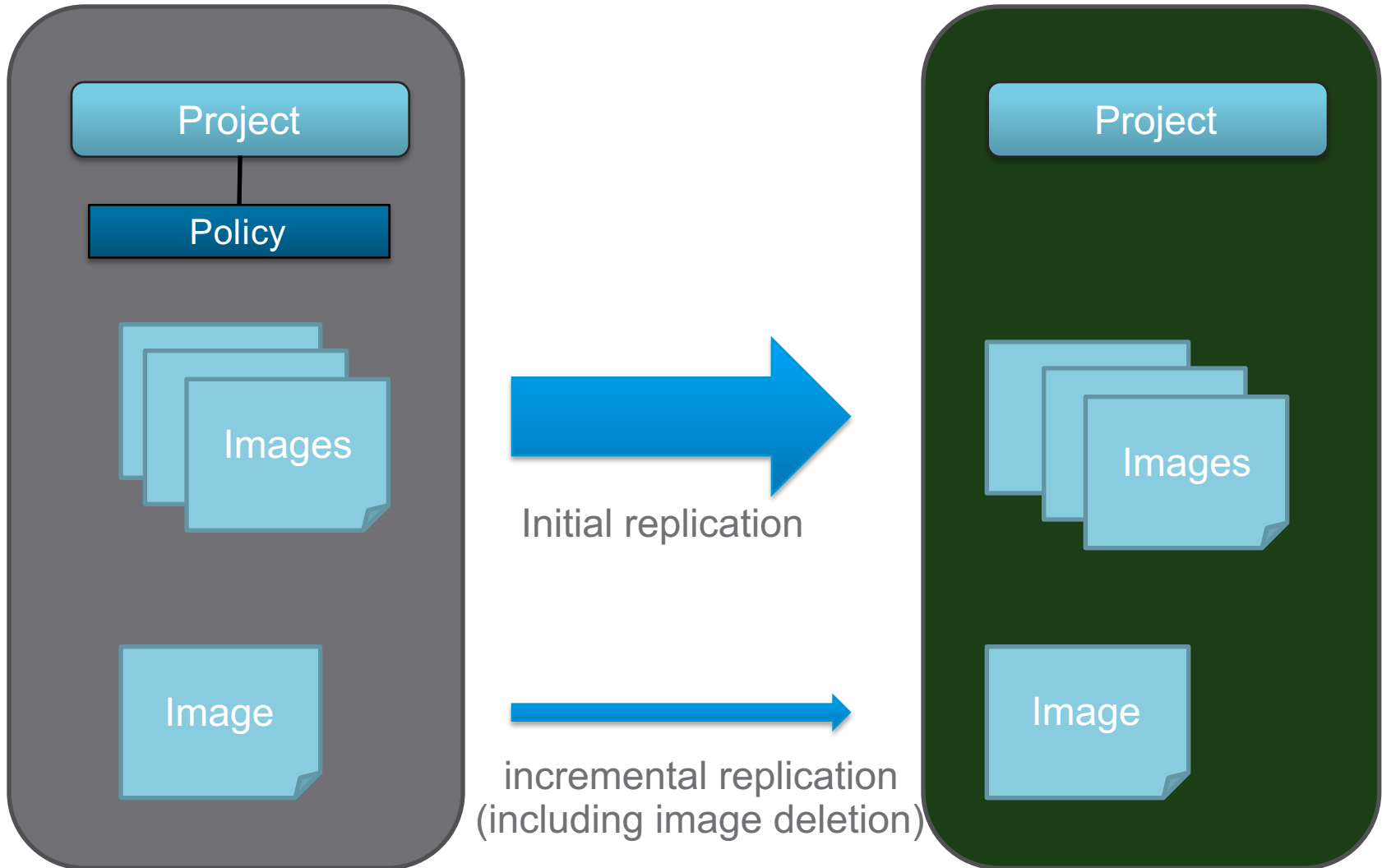
[Repositories](#) | [Replication](#) | [Users](#) | [Logs](#)

 Advanced Search

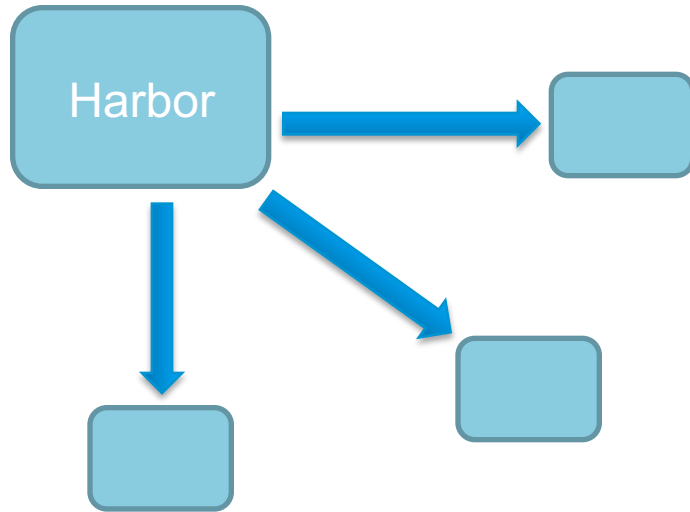
Username	Repository Name	Tag	Operation	Timestamp
jack	development/hello-world	latest	push	2016-07-04 17:09:07
jack	development/nginx	1.9	pull	2016-07-04 17:08:06
admin	development/redis	latest	push	2016-07-04 12:14:03
admin	development/nginx	1.9	pull	2016-07-04 12:04:24
admin	development/nginx	1.9	push	2016-07-03 18:39:27
daniel	development/nginx	1.9	push	2016-07-03 15:39:02
daniel	development/	N/A	create	2016-07-03 15:36:05



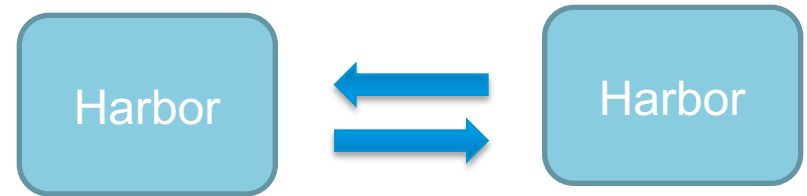
# Image replication (synchronization)



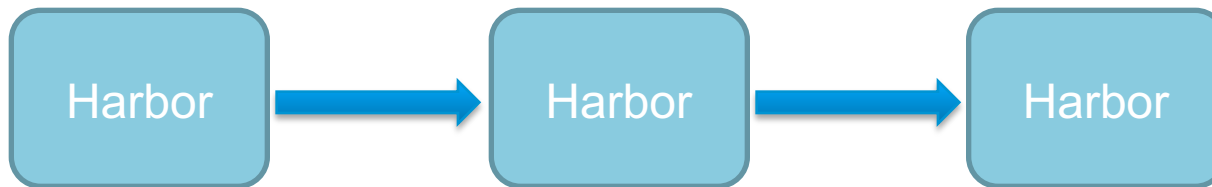
# Image replication (synchronization)



Master - Slave



Master - Master



Hierarchical

My Projects | Public Projects

development ▾ [Repositories](#) | [Replication](#) | [Users](#) | [Logs](#)






Name	Description	Destination	Last Start Time	Activation	Actions
sync to sh		sh target	2016-07-04 12:14:31	Enabled	
sync to US		US target	-	Disabled	

2 Item(s)

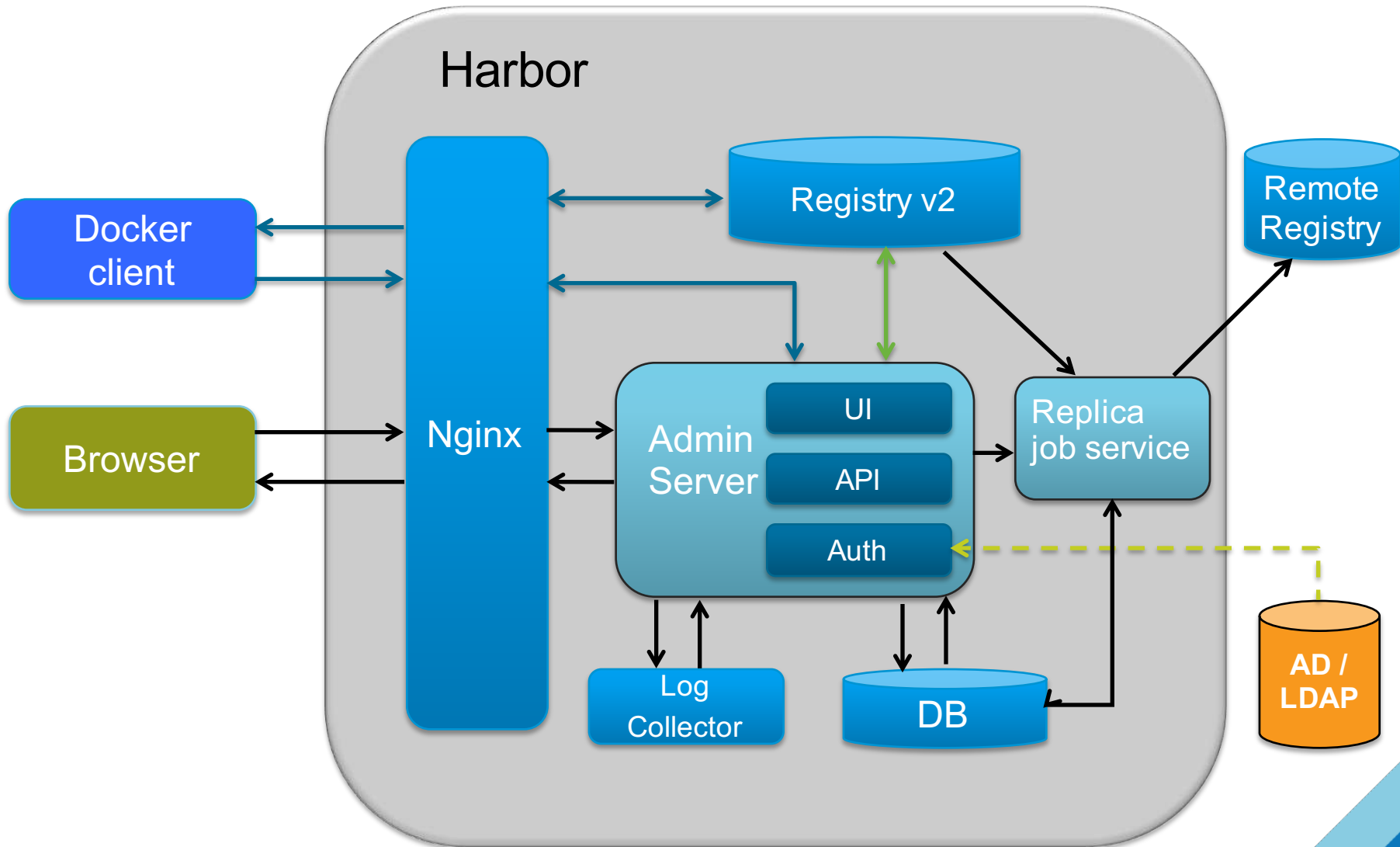
Replication Jobs

## Replication Jobs


 Status: All 
 From:  
 To:   

Name	Operation	Creation Time	End Time	Status	Logs
development/hello-world	Transfer	2016-07-04 17:09:07	2016-07-04 17:09:09	Finished	
development/redis	Transfer	2016-07-04 12:23:08	2016-07-04 12:23:09	Finished	
development/nginx	Transfer	2016-07-04 12:14:31	2016-07-04 12:14:31	Finished	
development/redis	Transfer	2016-07-04 12:14:31	2016-07-04 12:15:09	Finished	
development/redis	Transfer	2016-07-04 12:14:03	2016-07-04 12:14:03	Canceled	

# Harbor Architecture



# Harbor Roadmap



Q2 2016

New UI

Image Replication



Future

*HA Deployment,  
More auth options,  
labels for images....*

# Call for Participation



- Try, star and provide feedback, join wechat group.
- Partnership in customer cases
- Contribute to Project Harbor
  - Fork and Pull Request
  - Submit Issue
- <https://github.com/vmware/harbor/>

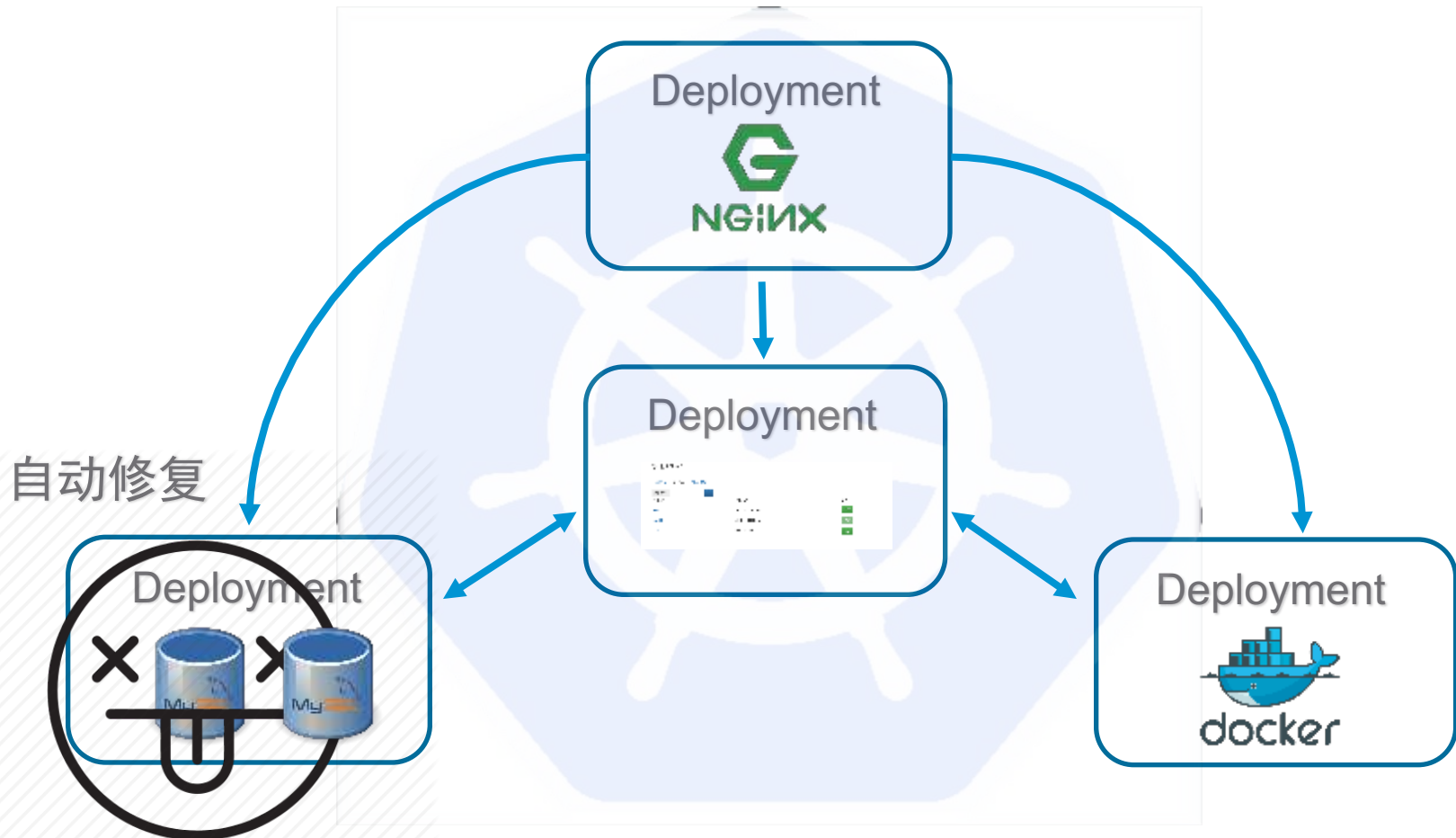


# Harbor系统架构

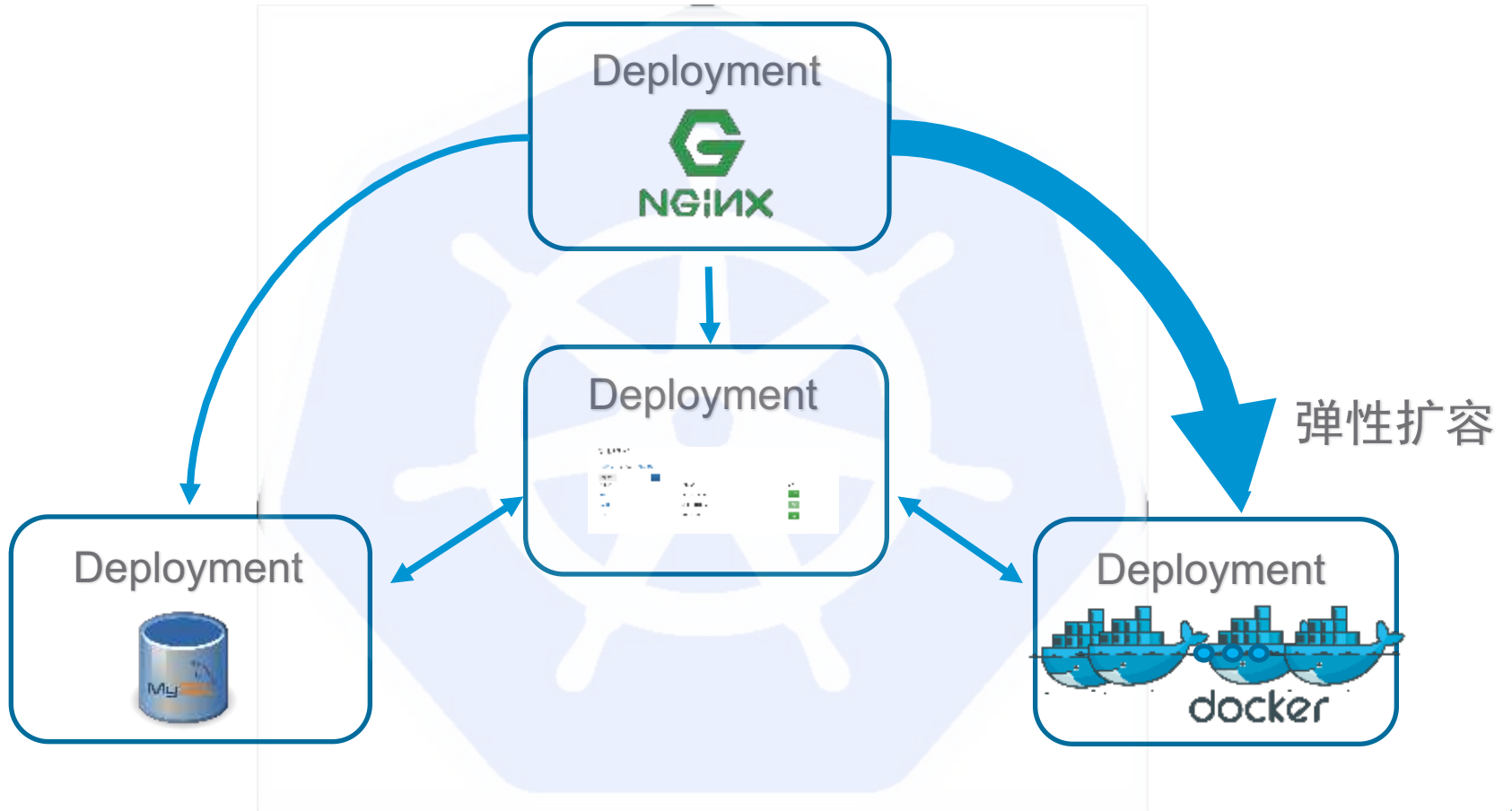




# Why Kubernetes ?



# Why Kubernetes ?



# Running Harbor on Kubernetes



- **Step 1: 容器化配置文件**
  - 将配置文件容器化实现统一调度
  - 静态配置文件
    - Email设置
    - Harbor管理员账号
    - ...

```
FROM library/registry:2.3.0

ADD ./config/registry/ /etc/registry/
ADD ./kubernetes/dockerfiles/registry-config.yml /etc/registry/config.yml

CMD ["/etc/registry/config.yml"]
```

# Running Harbor on Kubernetes



- **Step 2: 动态配置文件**
  - 内部服务地址 -> DNS
  - Registry地址
    - Registry地址为Kubernetes中的地址
    - Kubernetes会动态生成IP
    - 死循环?

```
spec:
  containers:
  - name: ui
    image: caicloud/harbor_deploy_ui:latest
    imagePullPolicy: Always
    env:
      - name: MYSQL_HOST
        value: mysql
      - name: MYSQL_PORT
        value: "3306"
      - name: MYSQL_USR
        value: root
      - name: MYSQL_PWD
        value: root123
      - name: REGISTRY_URL
        value: http://registry:5000
```

# Running Harbor on Kubernetes



- **Step 3: 配置Registry地址**

- 使用rolling-update
  - 先不设置IP，等IP产生好了之后再编译镜像
  - 使用rolling-update更新镜像
- 先启动Service
  - 先只启动Service，等IP好了之后再编译镜像
  - 用编译好的镜像启动Pod
- DNS服务

```
auth:
  token:
    issuer: registry-token-issuer
    realm: http://harbor.caicloud.io/service/token
    rootcertbundle: /etc/registry/root.crt
    service: token-service

notifications:
  endpoints:
    - name: harbor
      disabled: false
      url: http://harbor.caicloud.io/service/notifications
      timeout: 500
      threshold: 5
      backoff: 1000
```

# Running Harbor on Kubernetes



- **Step 4: 支持HTTPS协议**
  - 配置证书
    - 获取证书
    - 替换cert文件
  - 绕过证书
    - 编辑/etc/default/docker
    - 加入 `DOCKER_OPTS="$DOCKER_OPTS--insecure-registry={HOST}"`
    - 重启Docker: `sudo service docker restart`

**Thank You!**

