易保容器化之路

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July, 2018

里程碑

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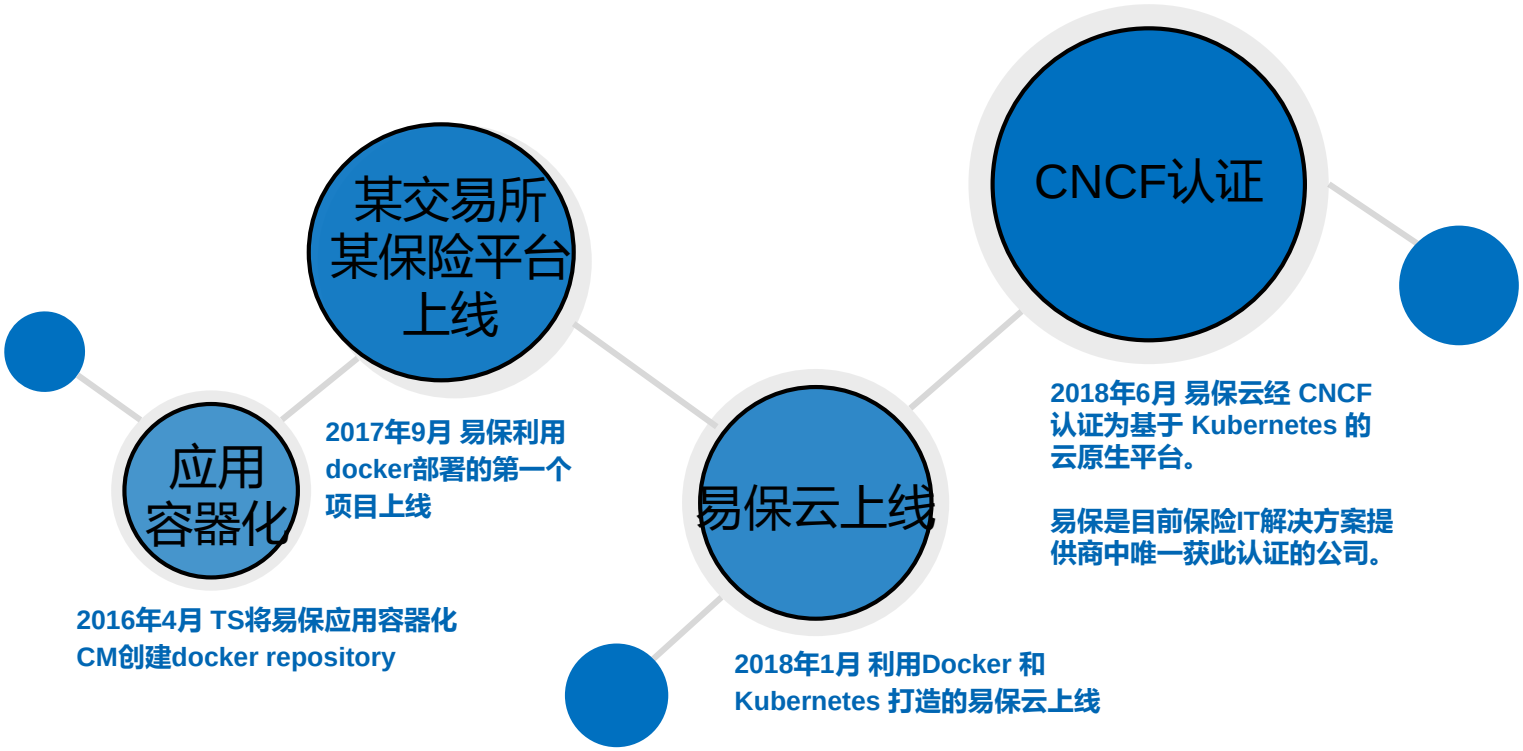

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易保为什么选择docker

我们的痛点：

- 越来越多的机器，过保的机器用的心惊胆战
- 环境对机器的依赖性很高，服务器维护，影响面大
- 多种不同版本操作系统的升级麻烦
- 服务无法实现弹性水平扩展，资源的调整会导致环境的不可用
- 无法动态调整资源，资源的使用率低。
- 环境配置不一致，导致问题排查困难

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我们的需求：

- NS虚拟化 → 提升性能节约成本
- 启动速度快 → 快速部署环境
- 镜像分层技术 → 更快的部署扩容
- CI环境构建 → 测试生产环境统一

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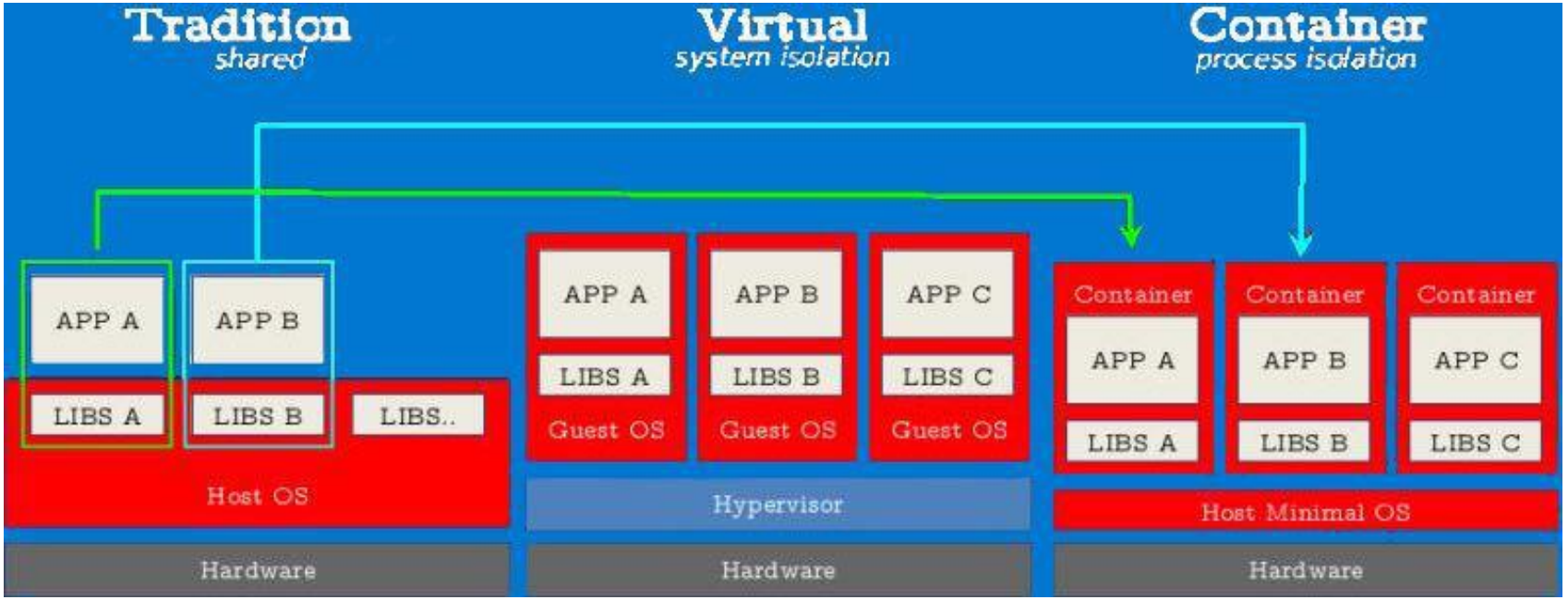
Docker 应用于基础架构

基础架构的变迁



Buy Less Server, Run More Environments

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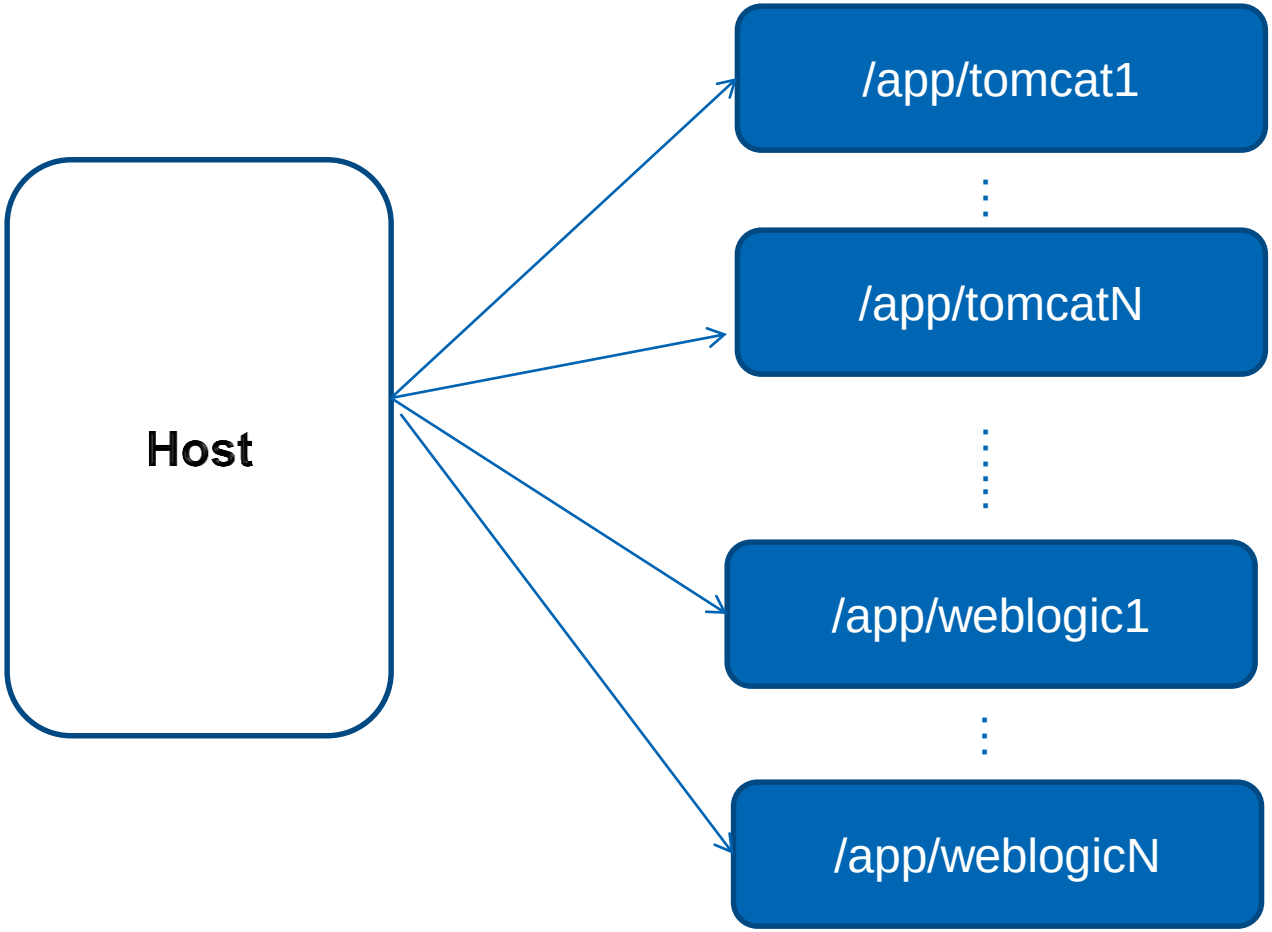
传统的环境分配方式



Every Instanace have one virtual IP

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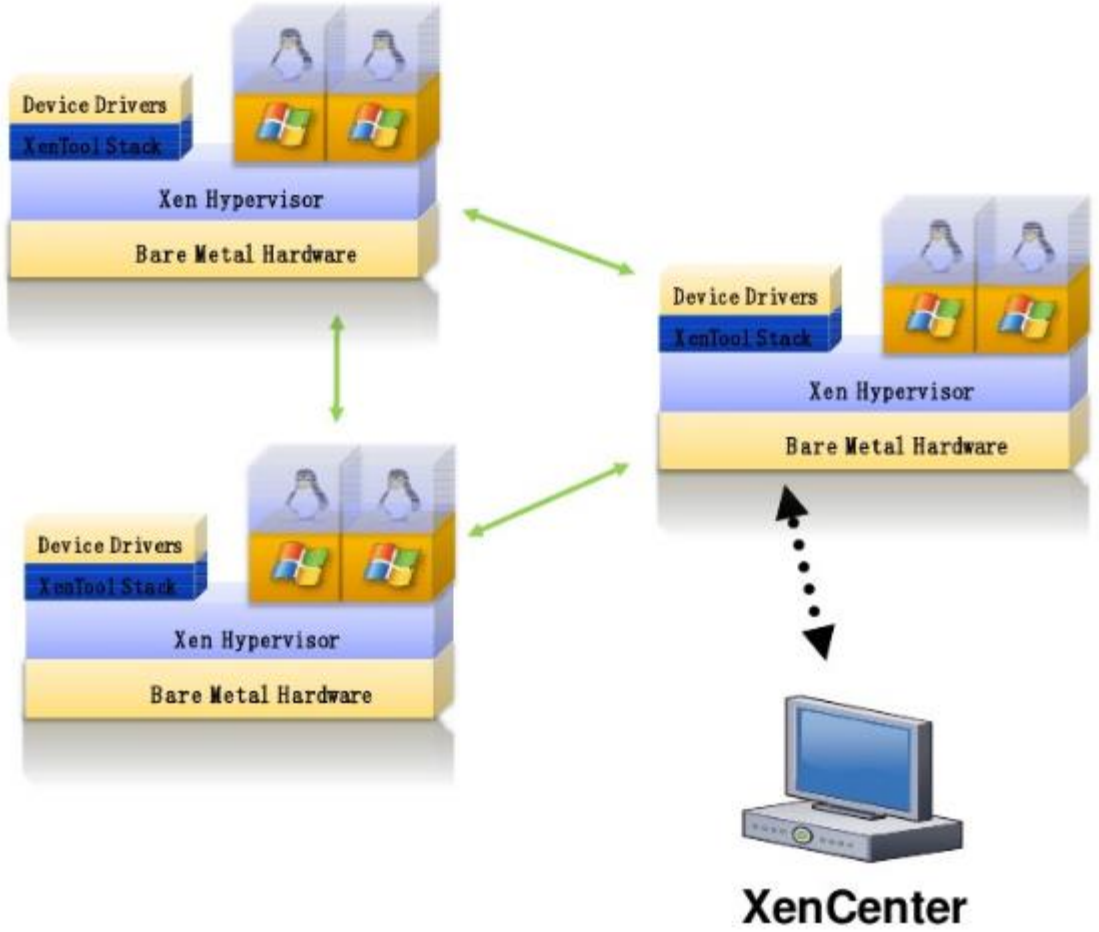
虚拟化

Xenserver



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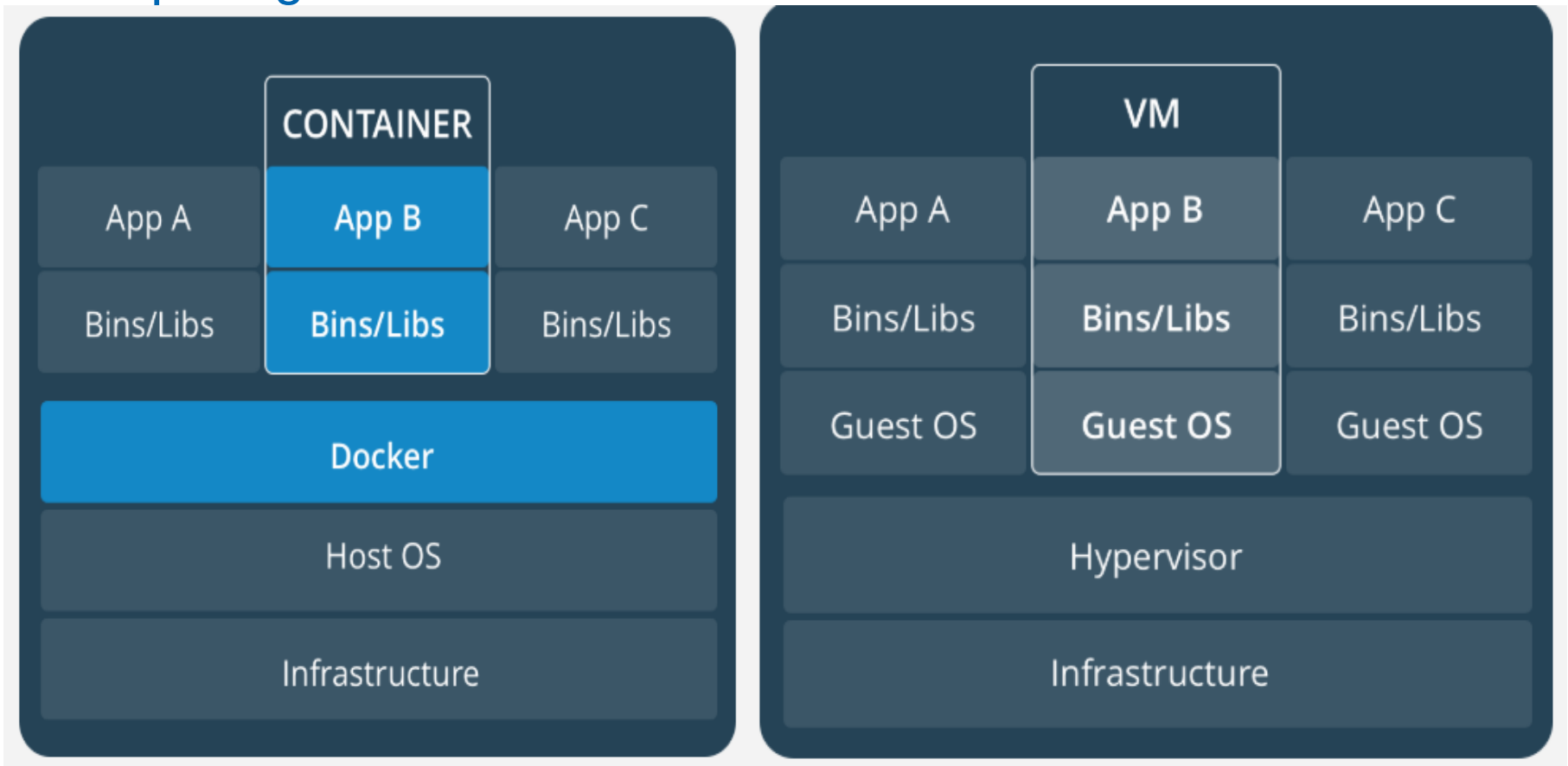
容器

Comparing Containers and Virtual Machines



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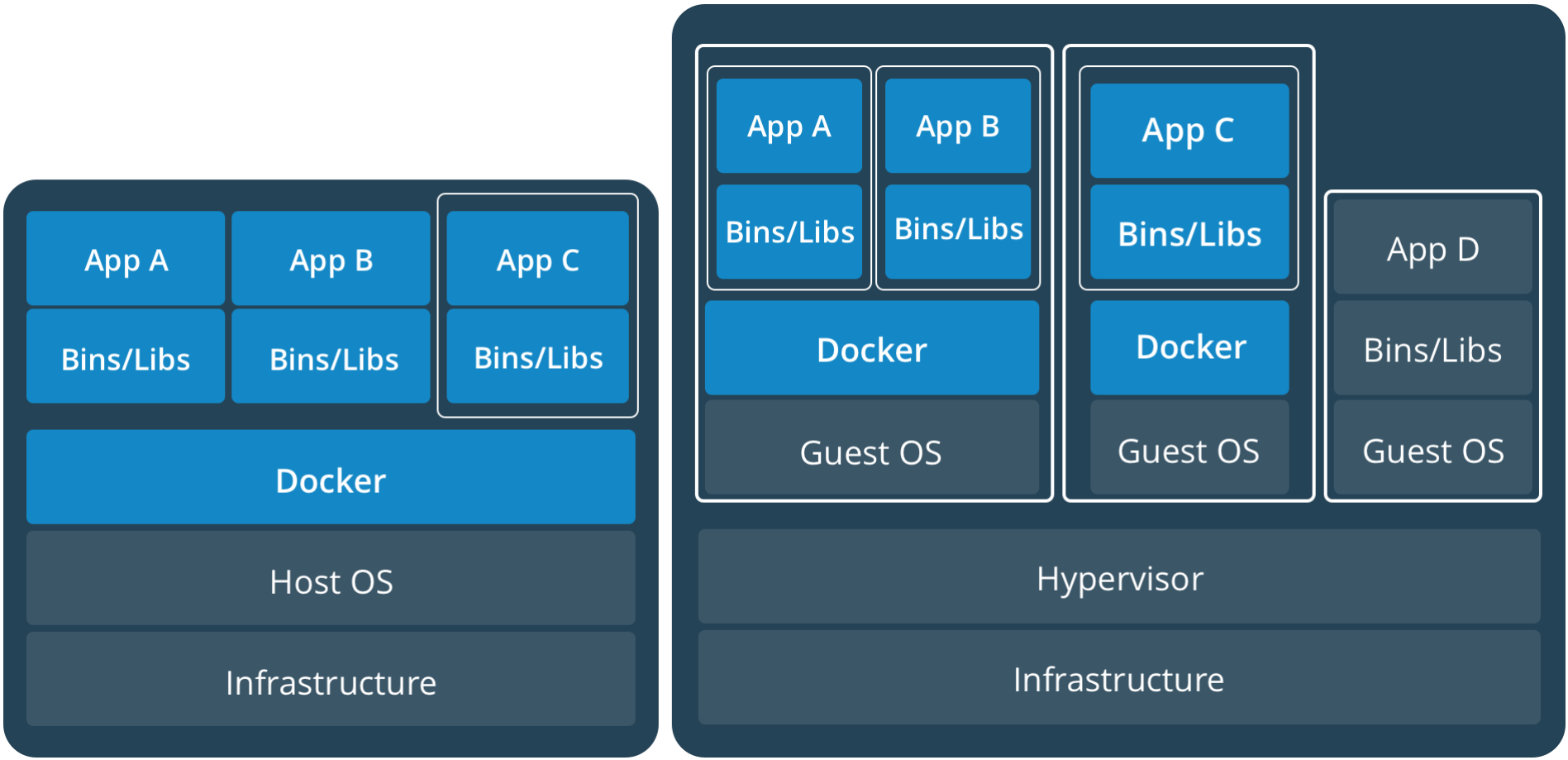
现在的基础架构

虚拟机+容器



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CI/CD

发布方式的改变

更轻，更快，更稳定

SSH

Jenkins 从svn或git取包后SSH到应用服务器

Salt

Jenkins调用利用Salt master来传输发布包，再到minion上执行发布

Kubelet

Jenkins 调用Master kubelet 来执行发布， Node会根据版本更新下载新的镜像

Jenkins

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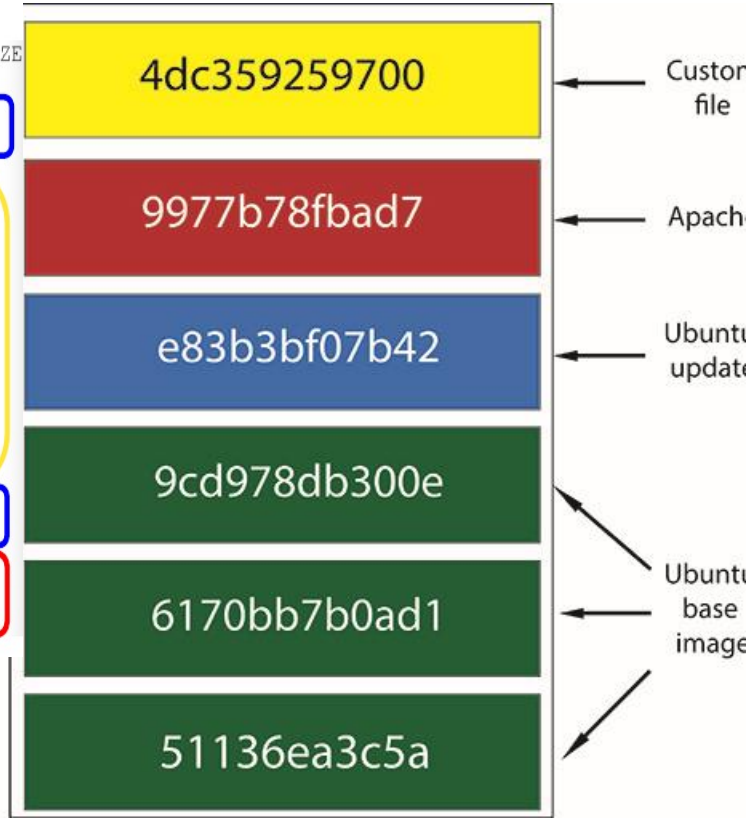
发布的镜像

version control for environment

	REPOSITORY	TAG	IMAGE ID	CREATED	VIRTUAL SIZE
服务镜像	root/ssh	centos7	d9bc1aa19308	13 minutes ago	248.9 MB
	root/registry.v2	centos7	32f3a32ff36c	14 minutes ago	261.6 MB
	root/registry	centos7	52a0614bc222	14 minutes ago	325 MB
	root/redis	centos7	ba455f28fcfa	17 minutes ago	281.6 MB
应用镜像	root/rabbitmq	centos7	f4a99ff0bc9b	18 minutes ago	321.2 MB
	root/python	centos7	5cf4e9e2f3c4	19 minutes ago	290.1 MB
	root/pys3qlfs	centos7	b8e1d7cc48f4	21 minutes ago	514.9 MB
	root/postgres	centos7	e99ea4e190d7	22 minutes ago	358.7 MB
	root/owncloud	centos7	f2fa562864e8	25 minutes ago	465.3 MB
	root/nginx	centos7	c42b889f6114	27 minutes ago	340.6 MB
	root/mongodb	centos7	13015d8d52d9	30 minutes ago	315.5 MB
	root/memcached	centos7	ff5a78746657	31 minutes ago	320.3 MB
	root/lighttpd	centos7	907407b160a2	33 minutes ago	286.9 MB
	root/hadoop	centos7	f4e86ee66aba	36 minutes ago	1.068 GB
	root/bind	centos7	5c0576170acf	49 minutes ago	293.3 MB
系统镜像	root/kube2sky	busybox	53362966aeca	About an hour ago	24.9 MB
	root/skydns	busybox	86b3868a11c5	About an hour ago	13.99 MB
基础镜像	wanda/centos7	latest	d94236583afc	About an hour ago	245.2 MB
	wanda/ubuntu	14.04	933b7553ece8	About an hour ago	228.3 MB
	wanda/busybox	latest	545487ff61fe	About an hour ago	973.2 kB



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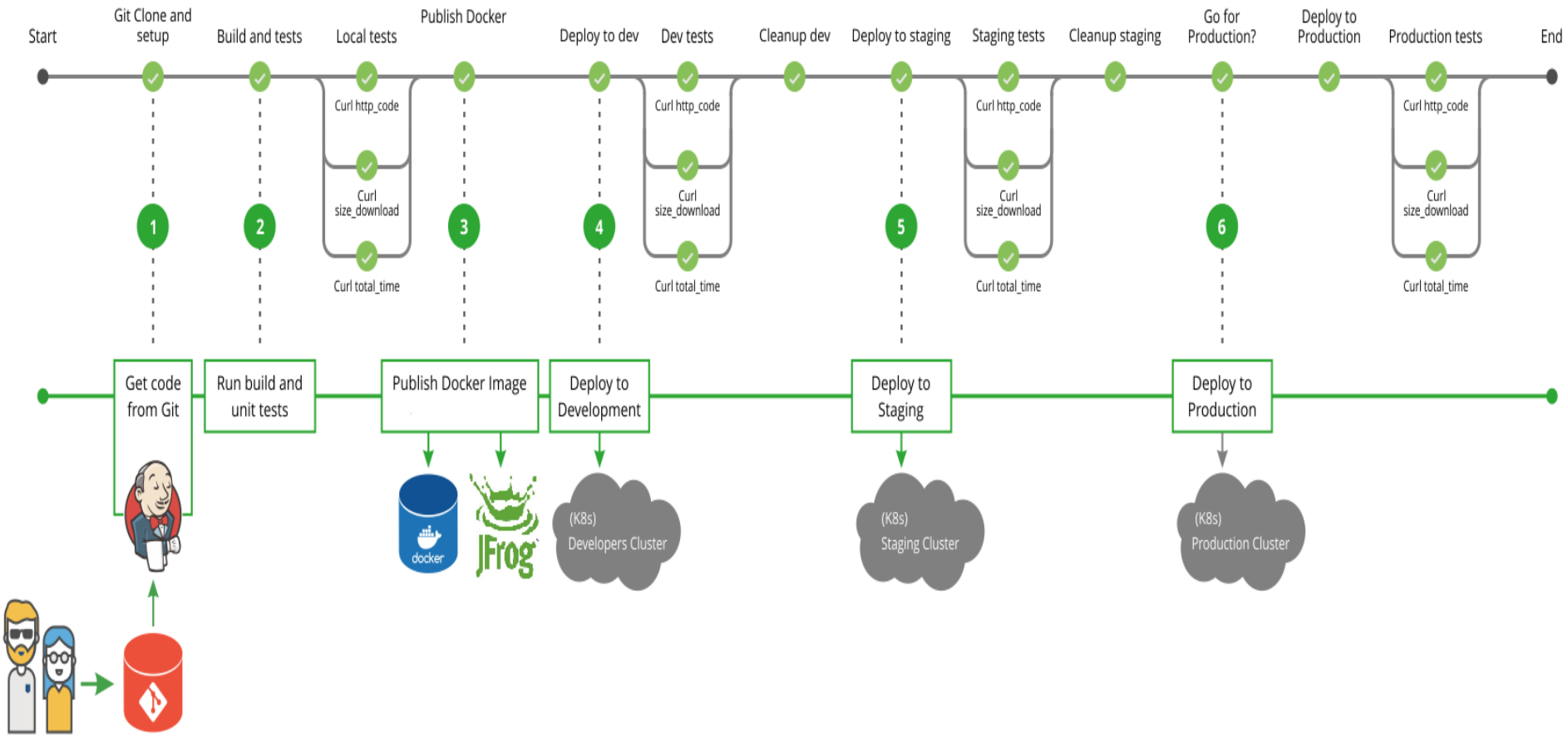
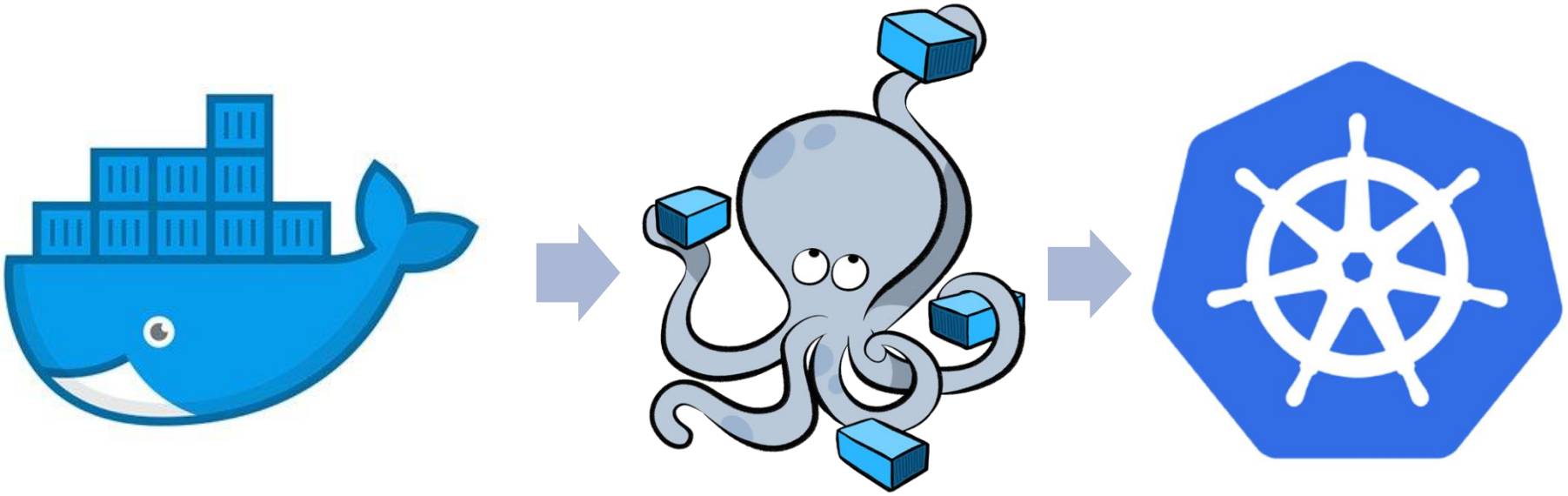
Automate CI/CD Pipeline With Jenkins,Gitlab, JFrog and Kubernetes



Docker，Docker Compose，Kubernetes

K8S之路



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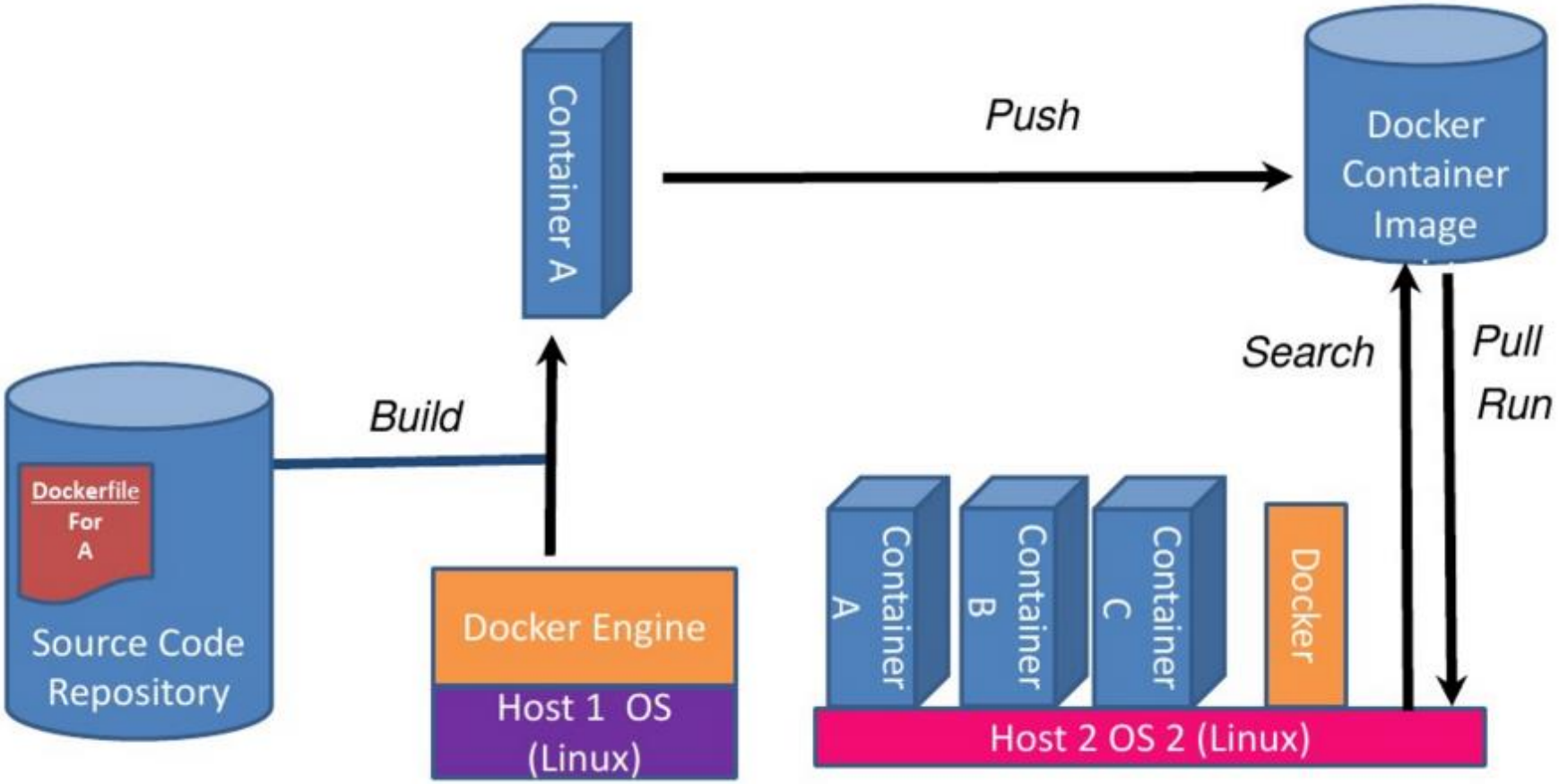
容器的构建流程



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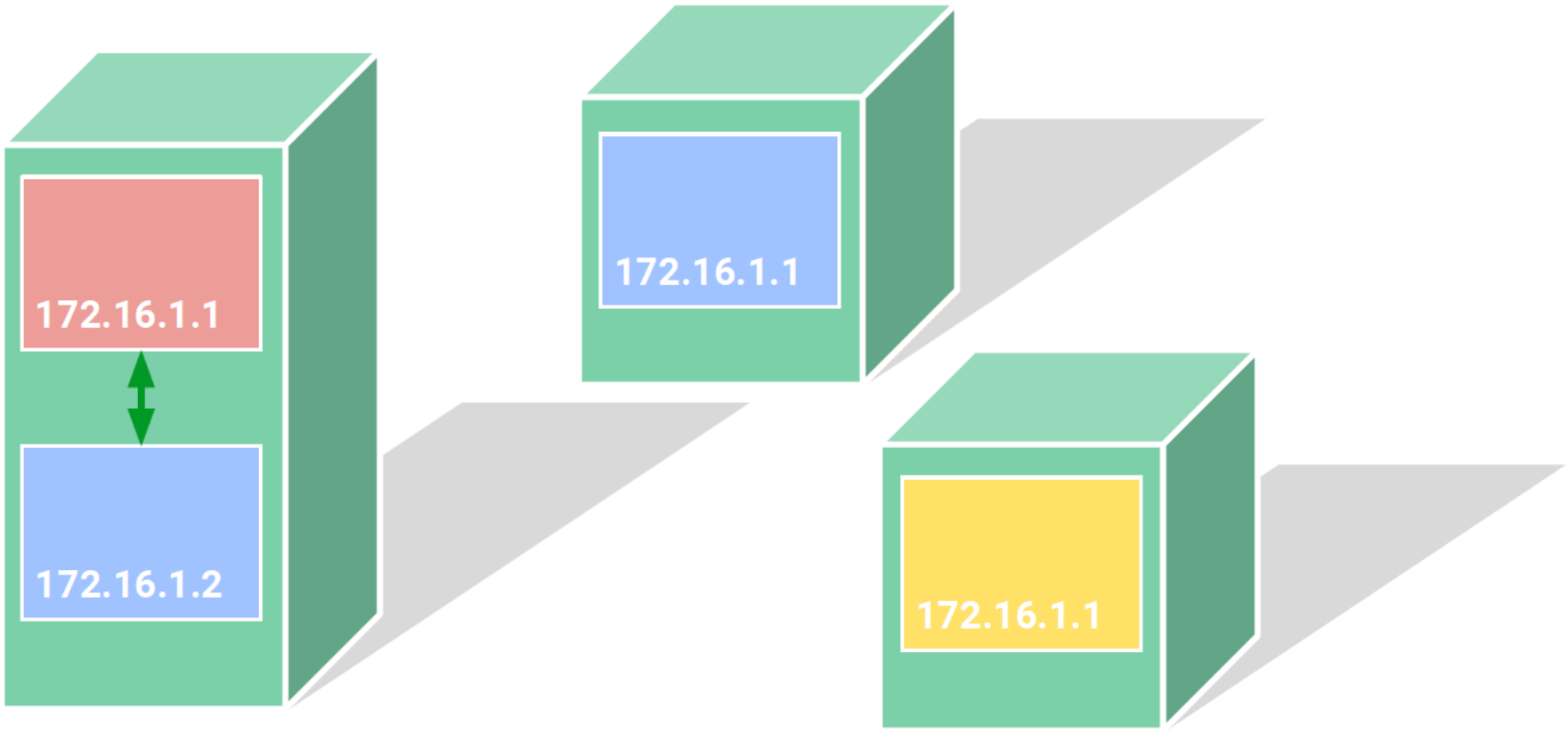
Docker 网络：bridge



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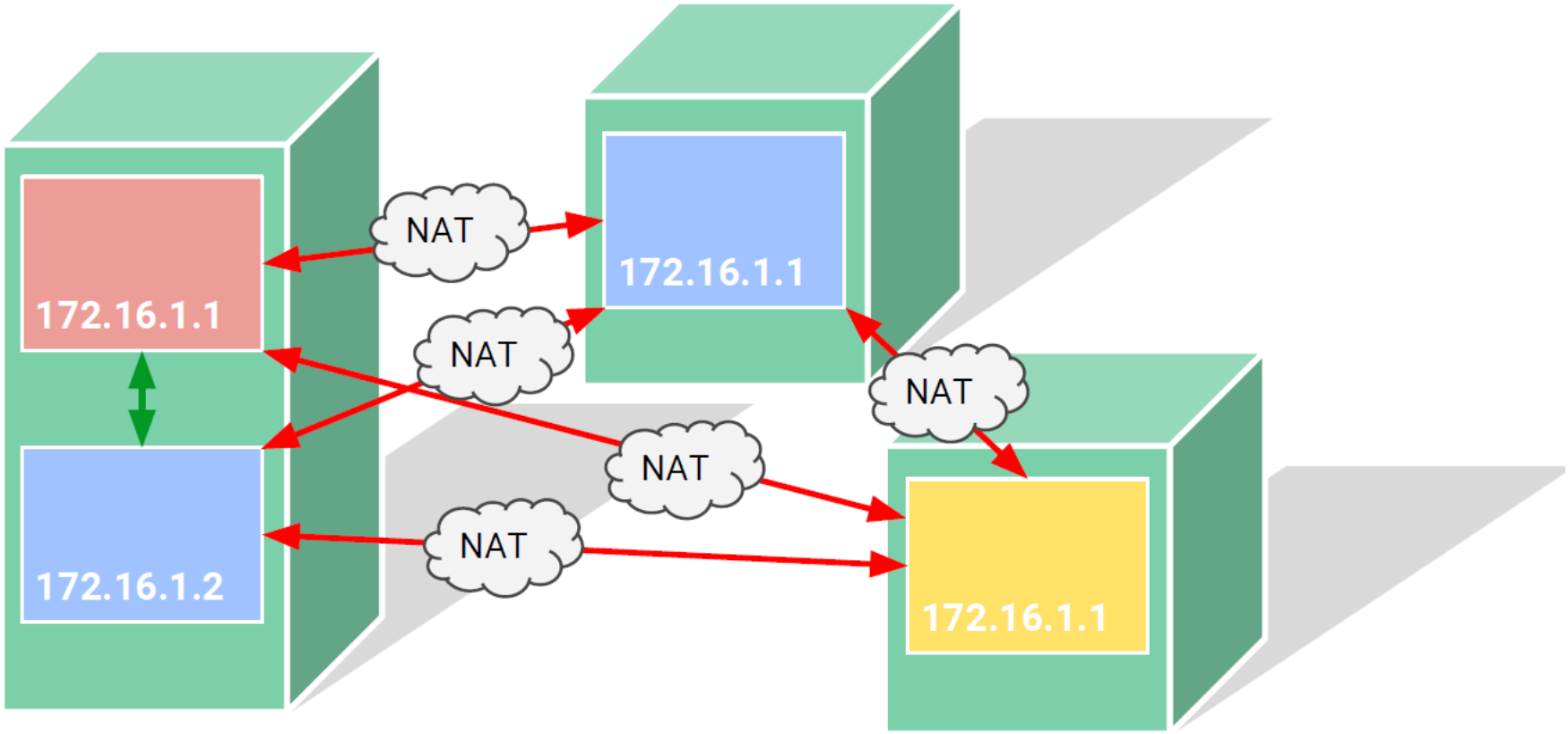
Docker 网络： Nat



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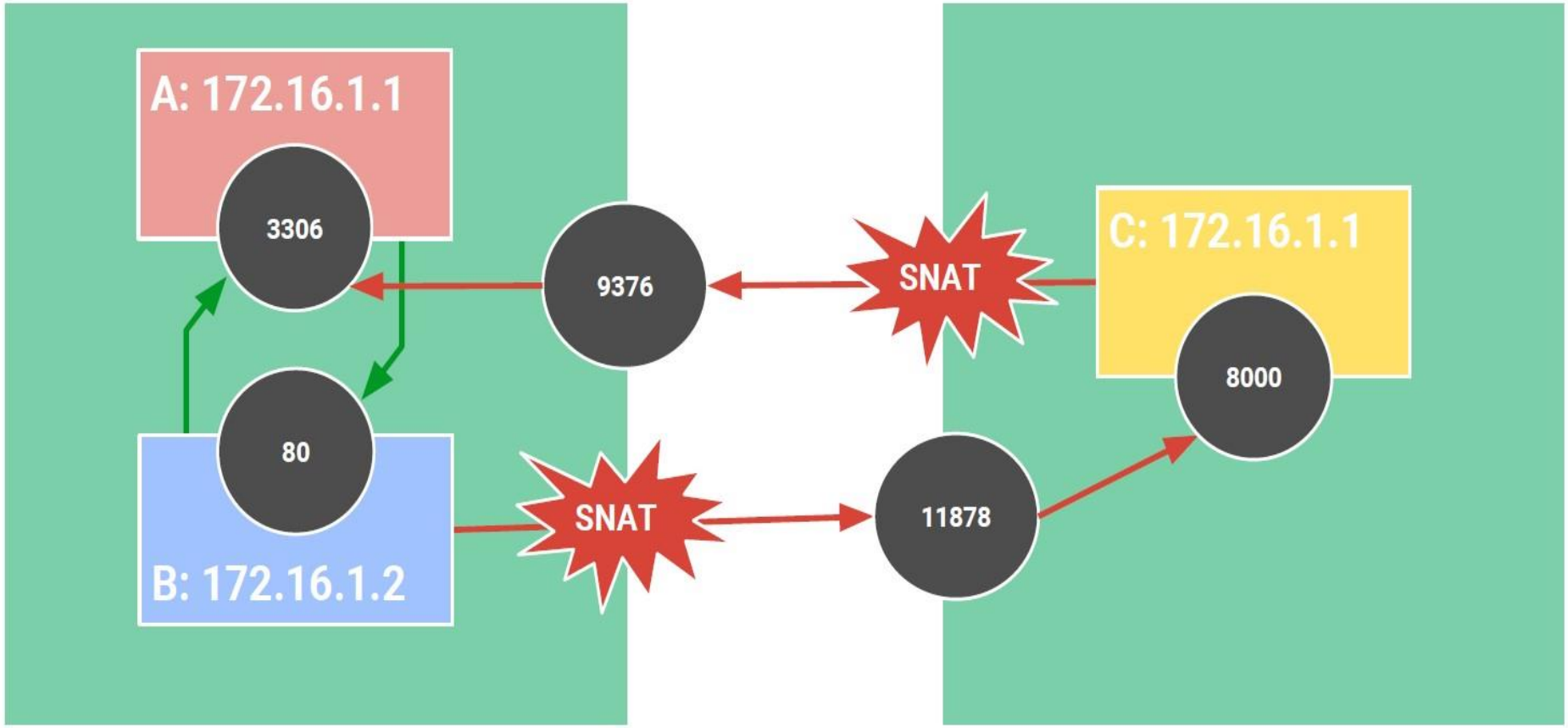
Docker 网络：端口映射



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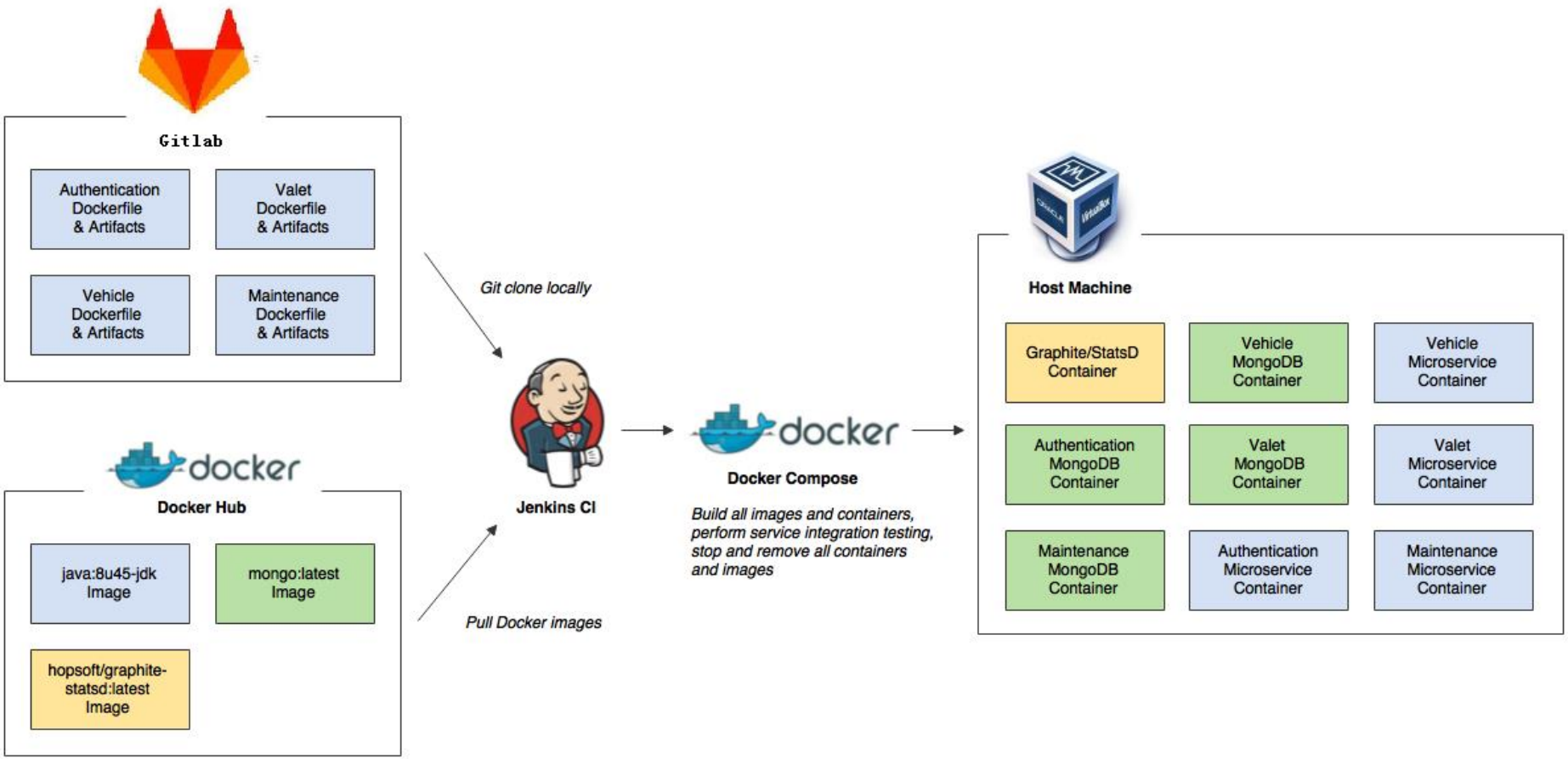
Docker-compose



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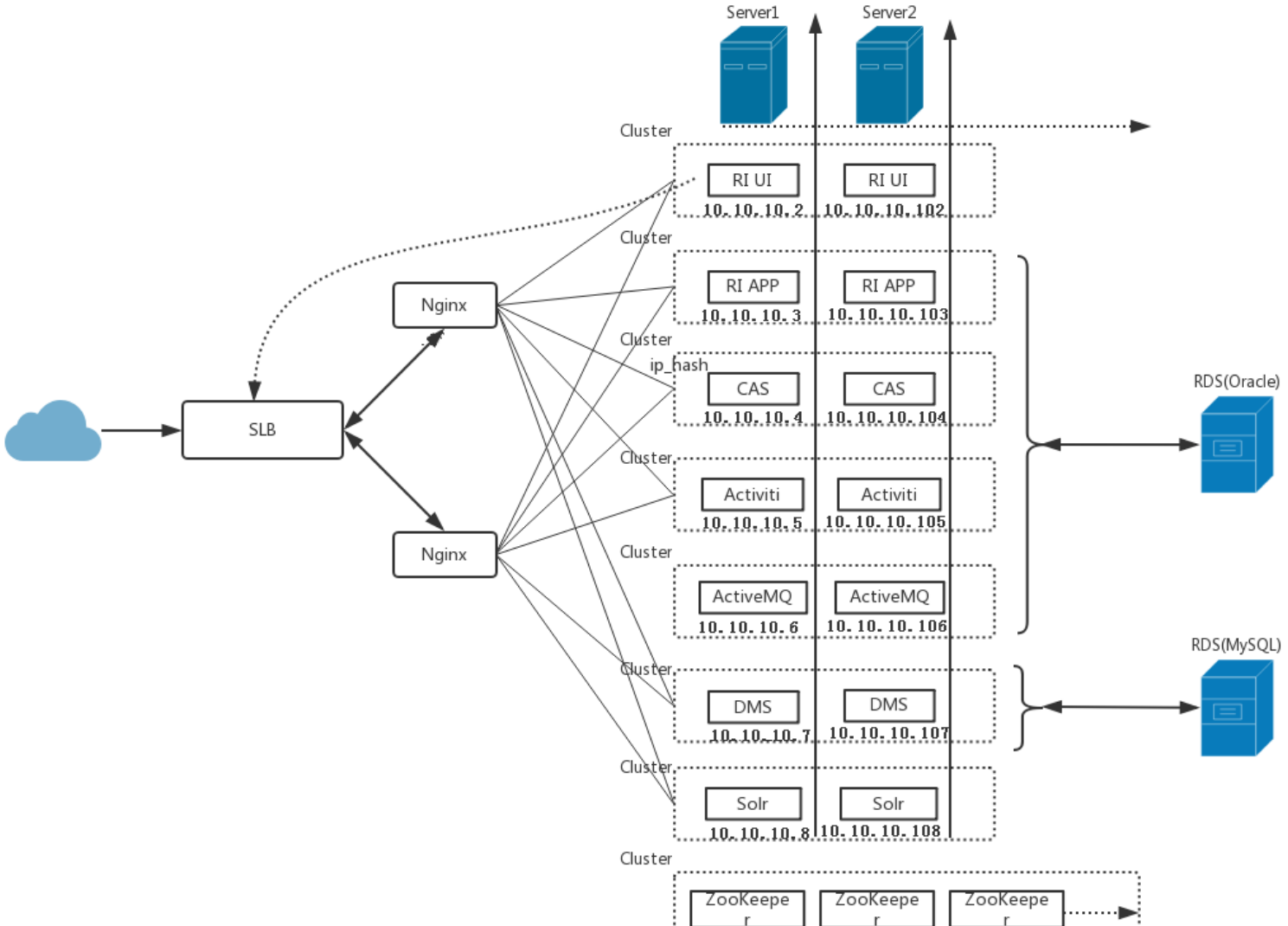
Docker-compose的应用

Docker as VM



Docker-compose的应用

Docker as VM

```
version: '3'
services:
  cas:
    container_name: cas
    image: dockerhub.ebaotech.com/cas:v1.6.8
    networks:
      testing_net:
        ipv4_address: 10.10.10.4
  activemq:
    container_name: activemq
    image: dockerhub.ebaotech.com/activemq:v1.6.8
    networks:
      testing_net:
        ipv4_address: 10.10.10.6
  solr:
    container_name: dockerhub.ebaotech.com/solr:v1.6.8
    image: some:image
    networks:
      testing_net:
        ipv4_address: 10.10.10.8

networks:
  prod_net:
    ipam:
      driver: default
      config:
        - subnet: 10.10.10.0/24
```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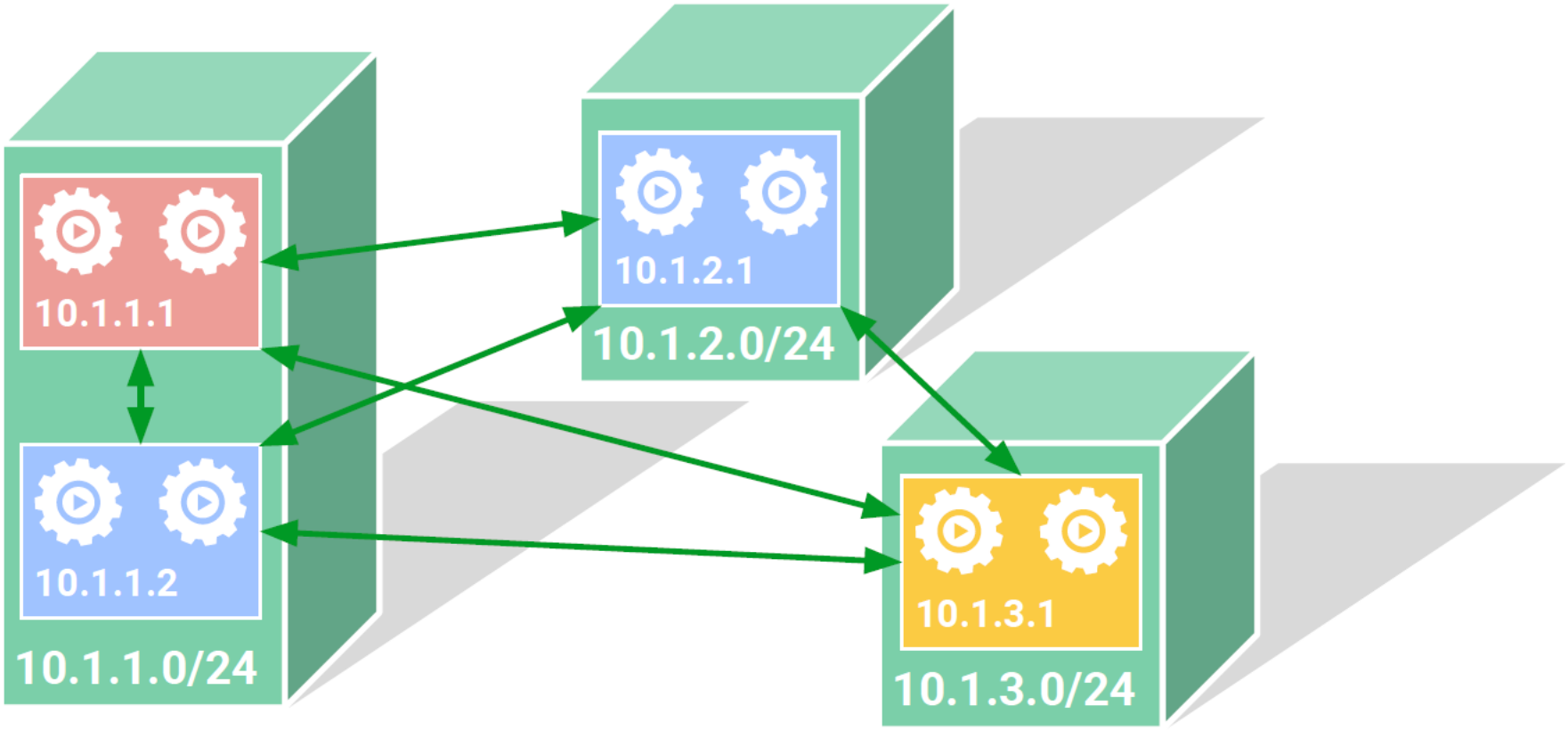
Kubernetes 网络



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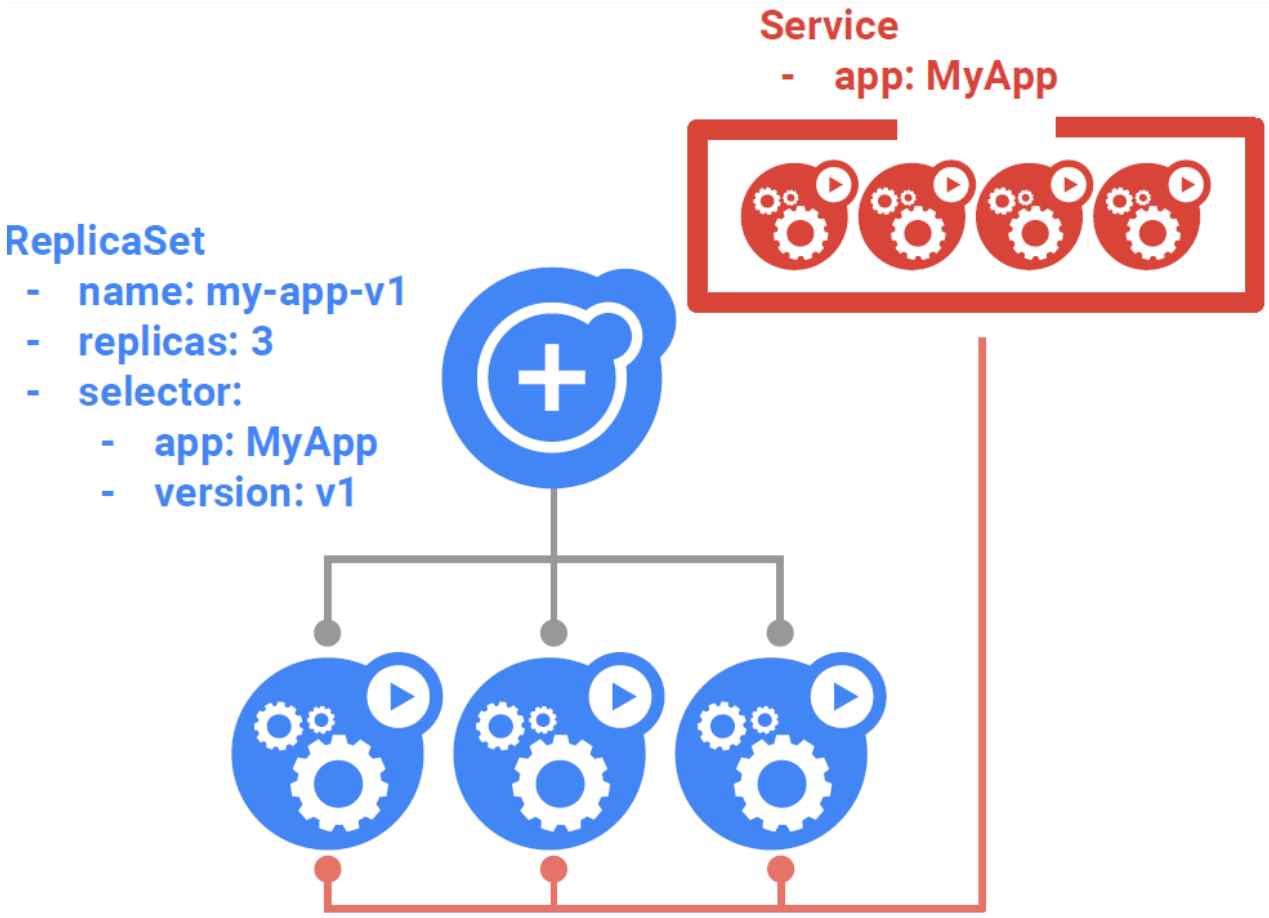
Kubernetes Rolling Update



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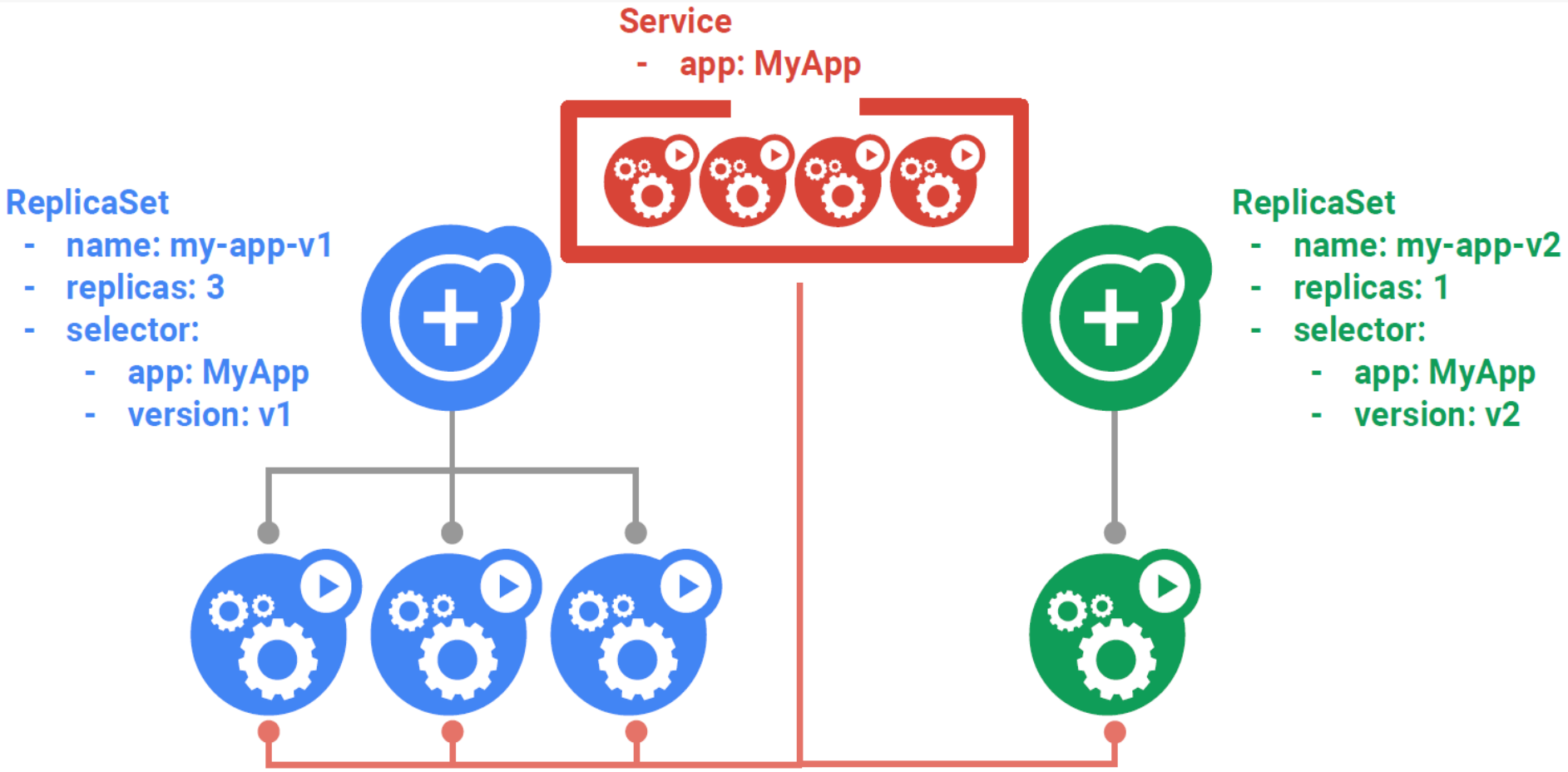
Kubernetes Rolling Update



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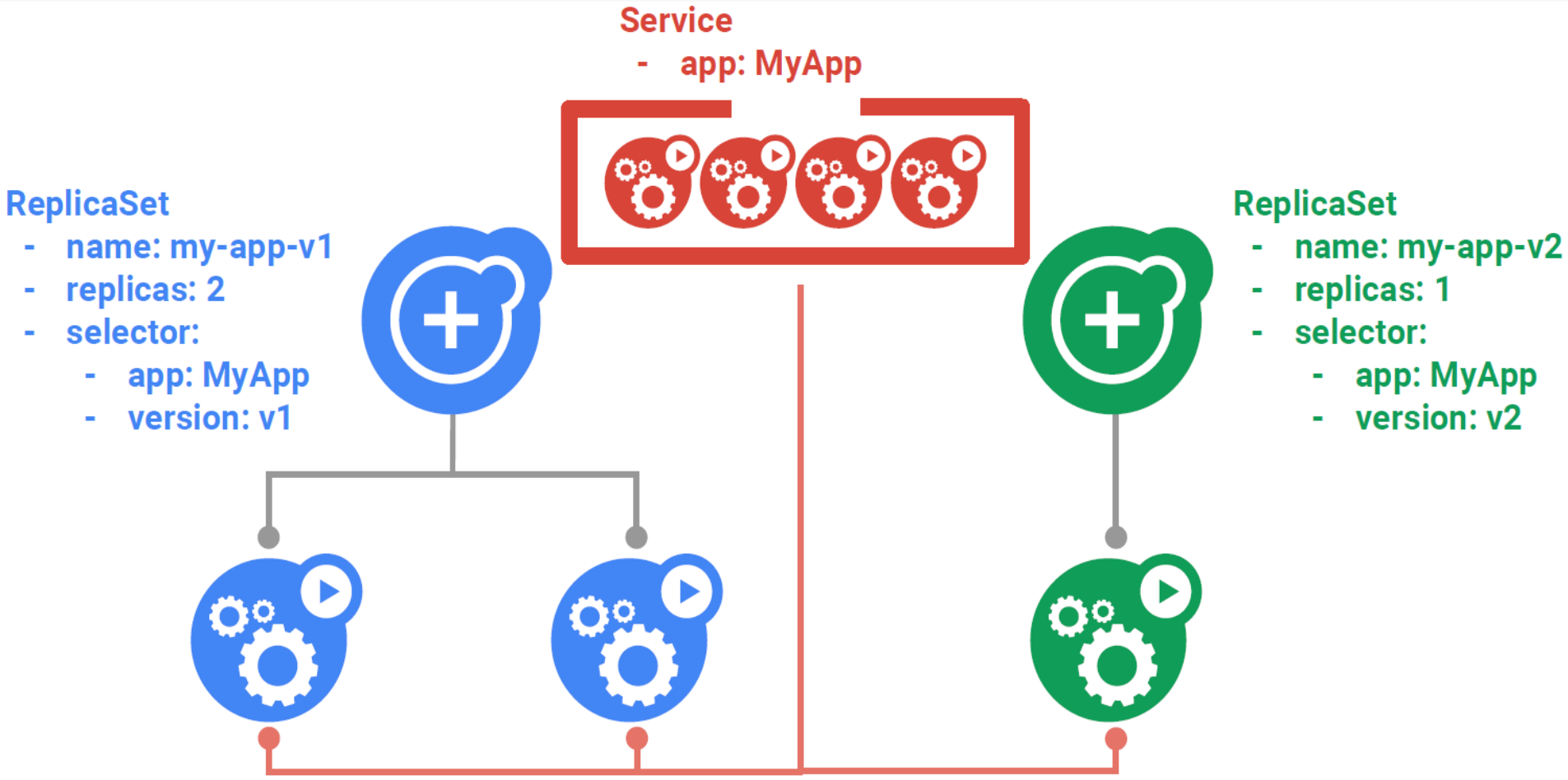
Kubernetes Rolling Update



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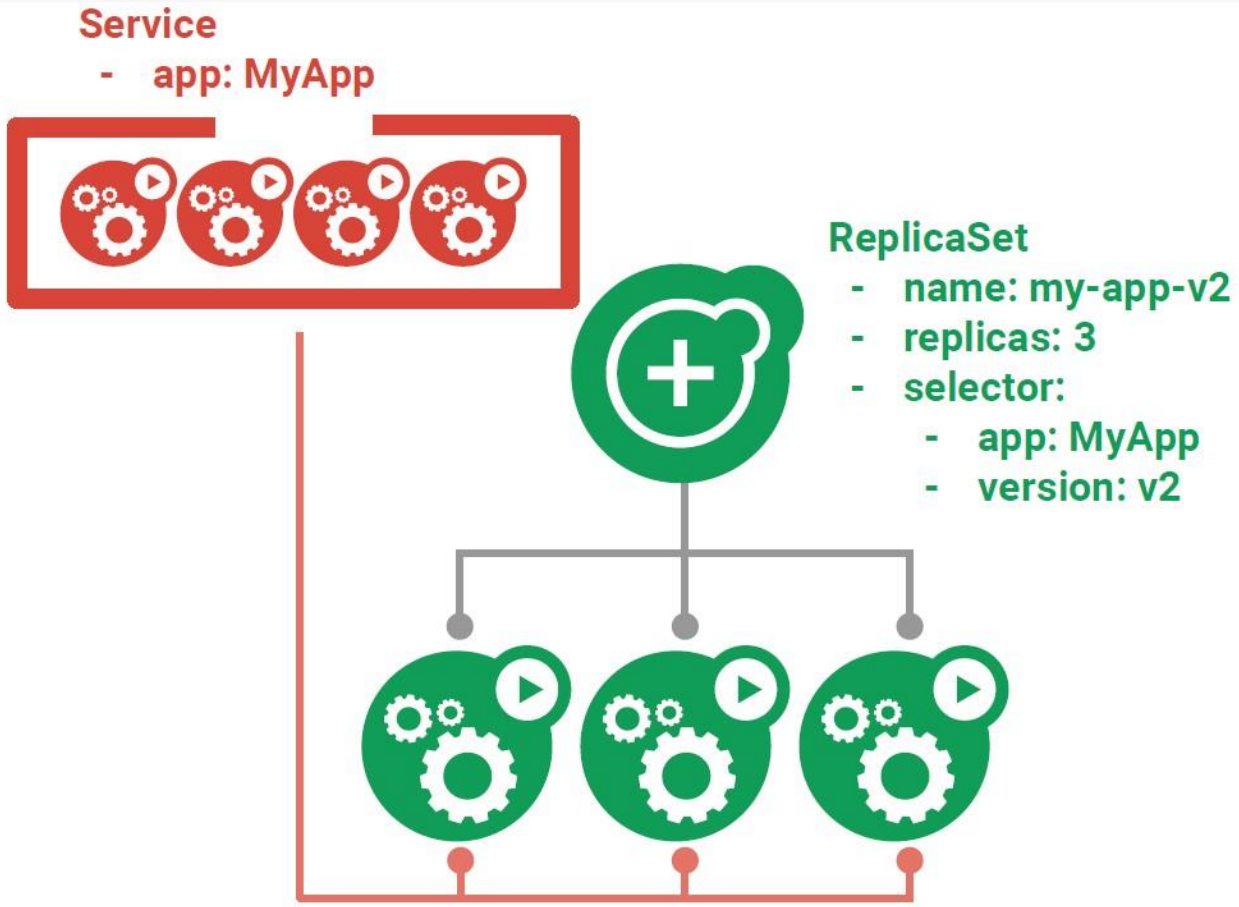
Kubernetes Rolling Update



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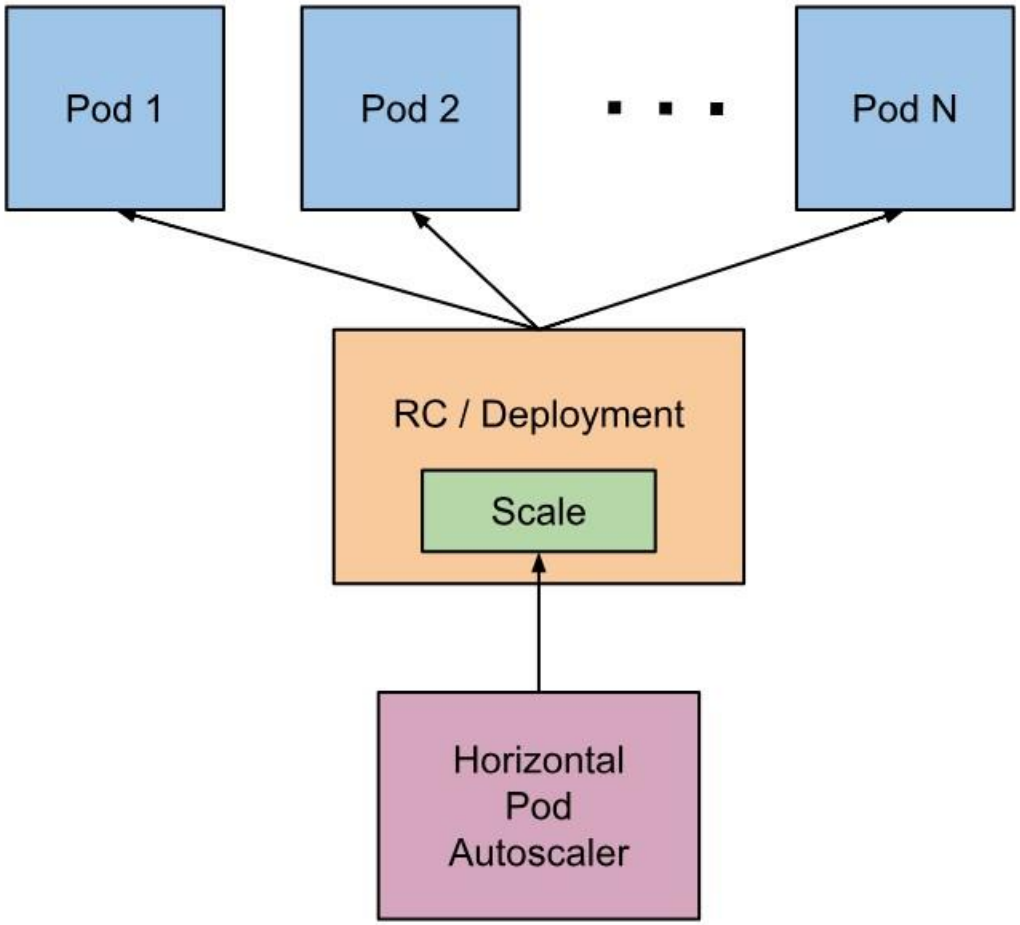
Kubernetes Autoscale

HPA（Horizontal Pod Autoscaling）



#kubectl autoscale deploy ghost --min=1 --max=10 --cpu-percent=20 -n dev

#kubectl get hpa -n dev
NAME REFERENCE TARGETS MINPODS MAXPODS REPLICAS AGE
ghost Deployment/ghost <unknown> / 20% 1 10 4 5m

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遇到的坑

坑

- Docker 从1.12升级到1.13遇到的跨Node的Pod无法通信问题
  1.Node上执行iptables-P FORWARD ACCEPT
  2. docker启动参数设置ExecStartPost=/usr/sbin/iptables-P FORWARD ACCEPT

- kubernetes1.9以前的版本，kubelet的cgroup-driver与docker设置的不一致导致无法启动
  1.sed -i "s/cgroup-driver=systemd/cgroup-driver=cgroupfs/g" /etc/systemd/system/kubelet.service.d/10-kubeadm.conf

- Kubernetes 升级到1.8后，token过期问题
  1.Master初始化的时候 –token-ttl设置0
  2. kubeadm token create重新生成

- V1.11取消了Cadvisor 10255端口，导致监控获取不到数据
  1.V1.7-V1.10没有问题，建议不要升级

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如何获取google镜像源

1. http proxy
2. RegistryMirror 来配置DaoCloud或者阿里云registry 镜像服务
3. docker hub 做中转
4. **将镜像压缩导入到本地**
5. k8s.gcr.io替换为registry.cn-hangzhou.aliyuncs.com/google_containers

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需要注意的

应用中需要注意的

image	• 1.Do not use latest tag in production environment • 2.Do not build from latest image
Security	• Do not open external IP for kubernetes dashboard
Upgrade	• Test Test Test

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易保云经 CNCF 认证为基于 Kubernetes 的云原生平台

目前保险IT解决方案提供商中唯一获此认证的公司

https://www.ebaotech.com/cn/newsroom/newspages/%E6%98%93%E4%BF%9D%E4%BA%91%E7%BB%8F+CNCF+%E8%AE%A4%E8%AF%81%E4%B8%BA%E5%9F%BA%E4%BA%8E+Kubernetes+%E7%9A%84%E4%BA%91%E5%8E%9F%E7%94%9F%E5%B9%B3%E5%8F%B0

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Demo Time

Demo for V1.9.3

Link： https://github.com/nhwuxiaojun/kubernetes-v1.9.3

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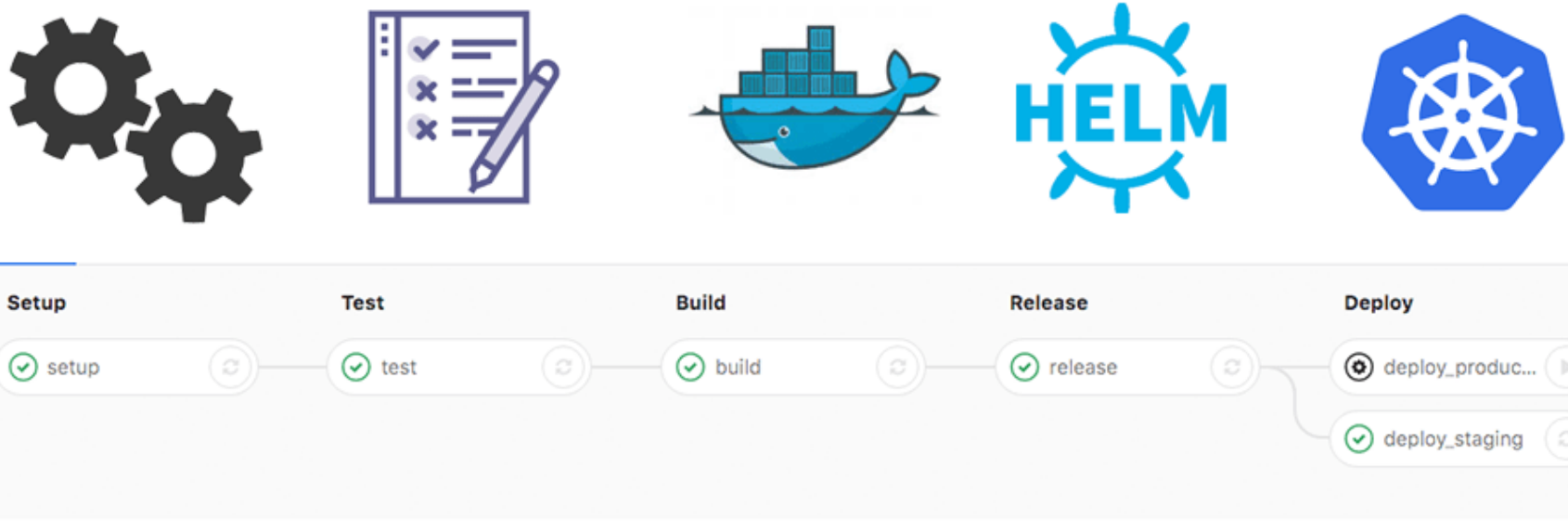
Next

Helm



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