

The background features a light blue grid pattern. On the left side, there is a decorative graphic of blue dots of varying sizes arranged in a circular pattern. Several circular icons are scattered across the background, including an hourglass, a power button, a recycling symbol, a gear, a laptop, and a network symbol.

SDCC 2016

中国软件开发大会

SOFTWARE DEVELOPER CONFERENCE CHINA

基于阿里云容器服务的持续集成与云端交付

莫源

阿里云高级开发工程师

目录

- 从运维的角度看容器
- 阿里云容器服务介绍
- 持续交付流程实践
- 实战中的问题与解法
- 挑战与展望

遥想当年夕阳下奔跑的运维少年

```
while(true) {
```

1. 查看nagios/zabbix报警、错误日志、备份状态、计划任务
2. 解决早上发现的问题，修修补补，扩缩容，进行例行维护
3. 上下线应用，出现问题即回滚
4. 开发自动化脚本协助工作
5. 告诉开发这不能干，告诉开发要这么干
6. 开会
7. 救火
8. 等待救火，5-8循环不息

```
}
```

```
// Where there is a shell, there is a way.
```

加速应用交付、缩短梦想的距离

传统IT系统

今天

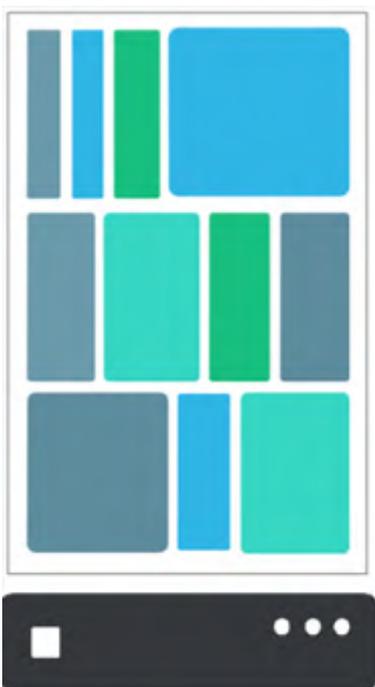
大兵团作战

Dev vs. Ops

缓慢变化

整体式应用

物理资源



战术小队

DevOps

快速迭代

微服务

云计算





哲学领域只有两个严肃的问题
生与死

软件开发领域严肃的问题
交付与维护

懂得如何交付才能更好运维

交付方式变革改变了全球经济格局

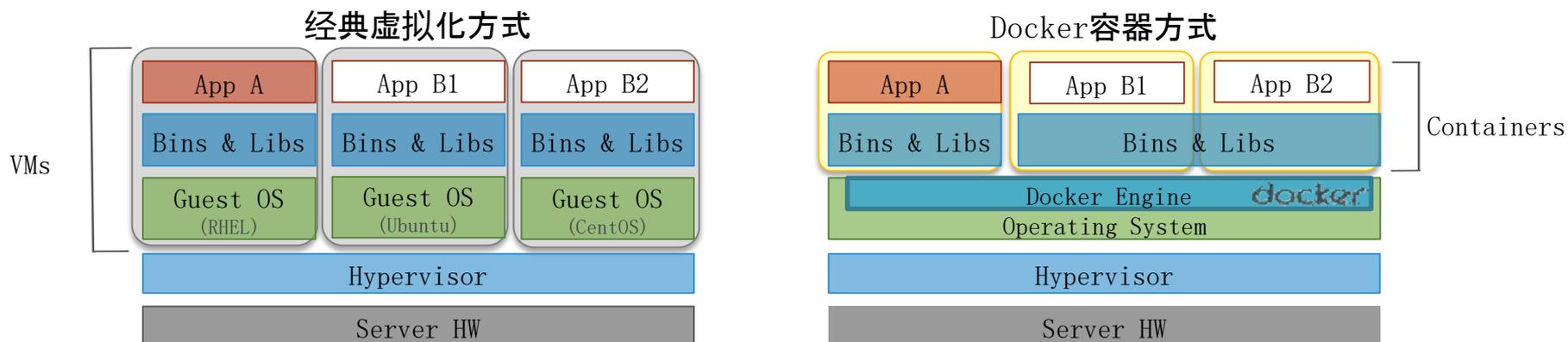
“没有集装箱，不可能有全球化。”——《经济学家》



Docker 改变软件交付方式

Docker 与虚拟化技术

- Docker是一种轻量级的操作系统虚拟化方案
 - 细粒度资源隔离 - 敏捷，降低企业成本
 - 定义了环境无关的标准的交付、部署规范 - 良好可移植性，提高运维效率
- 结合Docker容器和虚拟化技术
 - 利用虚拟机提供弹性基础架构，更好的安全隔离，动态热迁移
 - 利用容器技术实现简化应用部署、运维；实现弹性应用架构



Dockerfile定义交付环境

```
# Pull base image.
FROM dockerfile/ubuntu

# Install Nginx.
RUN \
  add-apt-repository -y ppa:nginx/stable && \
  apt-get update && \
  apt-get install -y nginx && \
  rm -rf /var/lib/apt/lists/* && \
  echo "\ndaemon off;" >> /etc/nginx/nginx.conf && \
  chown -R www-data:www-data /var/lib/nginx

# Define mountable directories.
VOLUME ["/etc/nginx/sites-enabled", "/etc/nginx/certs",
"/etc/nginx/conf.d", "/var/log/nginx", "/var/www/html"]

# Define working directory.
WORKDIR /etc/nginx

# Define default command.
CMD ["nginx"]

# Expose ports.
EXPOSE 80
EXPOSE 443
```

Compose模板定义交付内容

```
web:
  image: registry.aliyuncs.com/acs-sample/wordpress:4.5
  ports:
    - '80'
  environment:
    WORDPRESS_AUTH_KEY: changeme
    WORDPRESS_SECURE_AUTH_KEY: changeme
    WORDPRESS_LOGGED_IN_KEY: changeme
    WORDPRESS_NONCE_KEY: changeme
    WORDPRESS_AUTH_SALT: changeme
    WORDPRESS_SECURE_AUTH_SALT: changeme
    WORDPRESS_LOGGED_IN_SALT: changeme
    WORDPRESS_NONCE_SALT: changeme
    WORDPRESS_NONCE_AA: changeme
  restart: always
  links:
    - 'db:mysql'
  labels:
    aliyun.logs: /var/log
    aliyun.probe.url: http://container/license.txt
    aliyun.probe.initial_delay_seconds: '10'
    aliyun.routing.port_80: http://wordpress
    aliyun.scale: '3'
db:
  image: registry.aliyuncs.com/acs-sample/mysql:5.7
  environment:
    MYSQL_ROOT_PASSWORD: password
  restart: always
  labels:
    aliyun.logs: /var/log/mysql
```

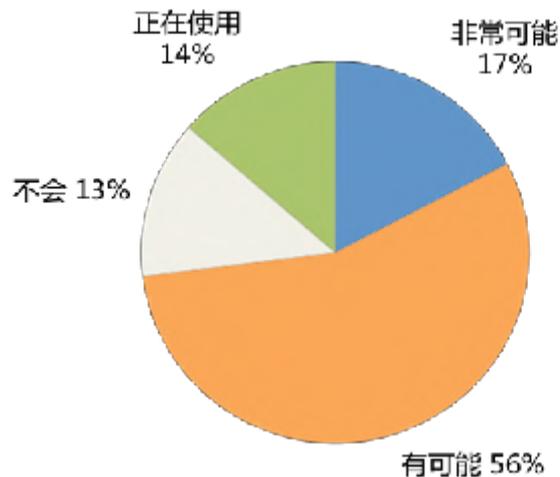
标准化命令定义交付方式

```
Commands:
  attach      Attach to a running container
  build       Build an image from a Dockerfile
  commit      Create a new image from a container's changes
  cp          Copy files/folders between a container and the local filesystem
  create      Create a new container
  deploy      Create and update a stack from a Distributed Application Bundle (DAB)
  diff        Inspect changes on a container's filesystem
  events      Get real time events from the server
  exec        Run a command in a running container
  export      Export a container's filesystem as a tar archive
  history     Show the history of an image
  images      List images
  import      Import the contents from a tarball to create a filesystem image
  info        Display system-wide information
  inspect     Return low-level information on a container, image or task
  kill        Kill one or more running containers
  load        Load an image from a tar archive or STDIN
  login       Log in to a Docker registry.
  logout      Log out from a Docker registry.
  logs        Fetch the logs of a container
  network     Manage Docker networks
  node        Manage Docker Swarm nodes
  pause       Pause all processes within one or more containers
  plugin      Manage Docker plugins
  port        List port mappings or a specific mapping for the container
  ps          List containers
  pull        Pull an image or a repository from a registry
  push        Push an image or a repository to a registry
  rename      Rename a container
  restart     Restart a container
  rm          Remove one or more containers
  rmi         Remove one or more images
  run         Run a command in a new container
  save        Save one or more images to a tar archive (streamed to STDOUT by default)
  search      Search the Docker Hub for images
  service     Manage Docker services
  stack       Manage Docker stacks
  start       Start one or more stopped containers
  stats       Display a live stream of container(s) resource usage statistics
  stop        Stop one or more running containers
```

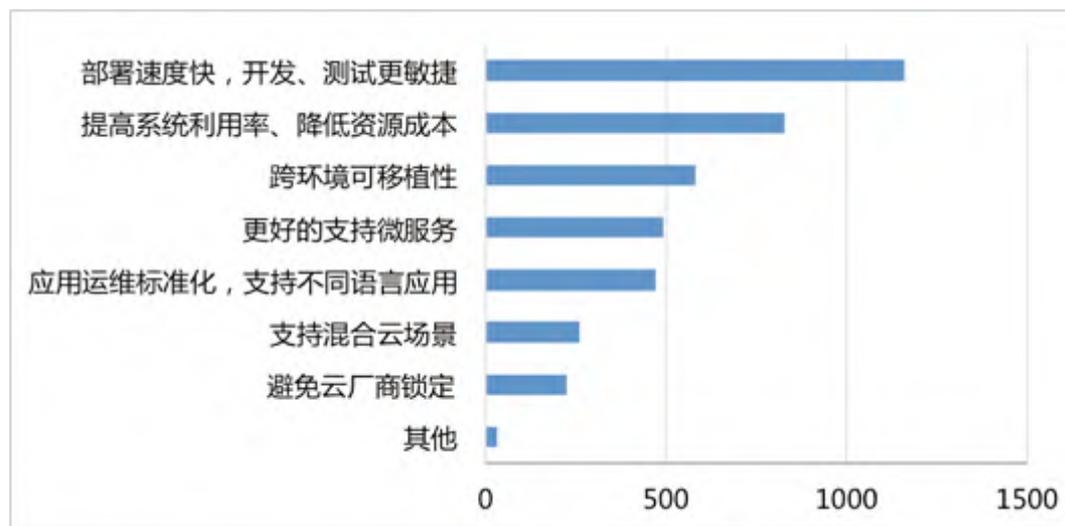
中国容器市场现状分析

- 容器技术爆发式增长，中国市场开始起步，容器技术前景广阔：超过 85% 用户有意愿使用容器技术
- 70% 将容器用于公共云, 45% 考虑容器用于混合云

未来6个月是否会采用容器技术

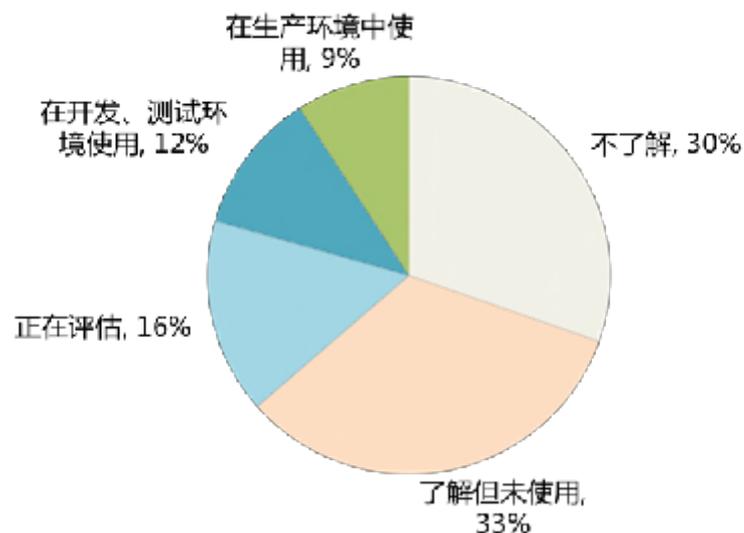


容器技术对企业的价值点

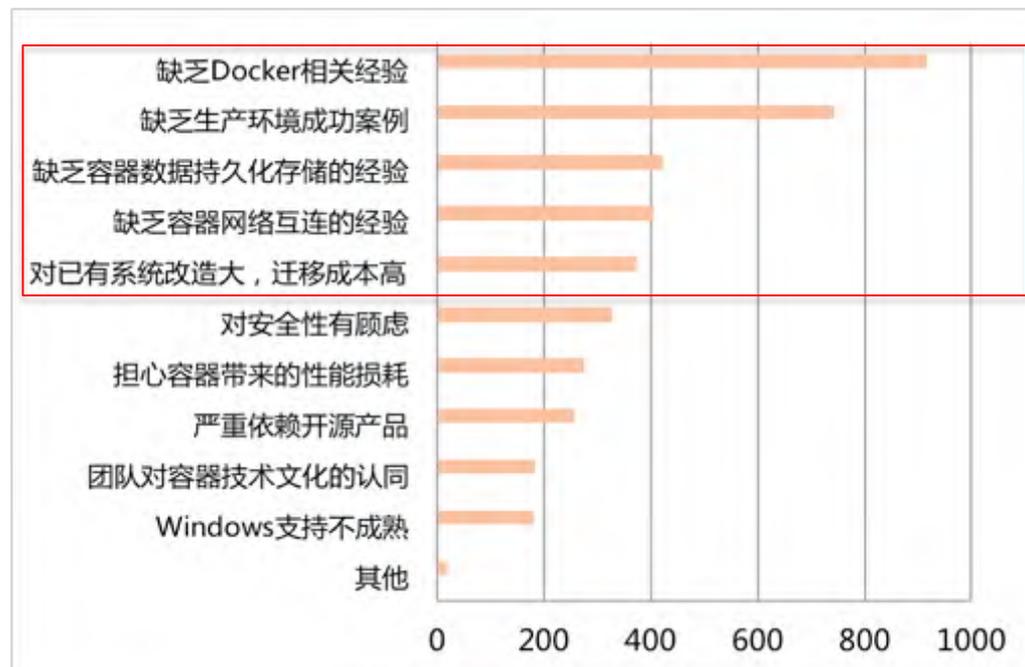


期盼与怀疑并存

容器技术实施现状



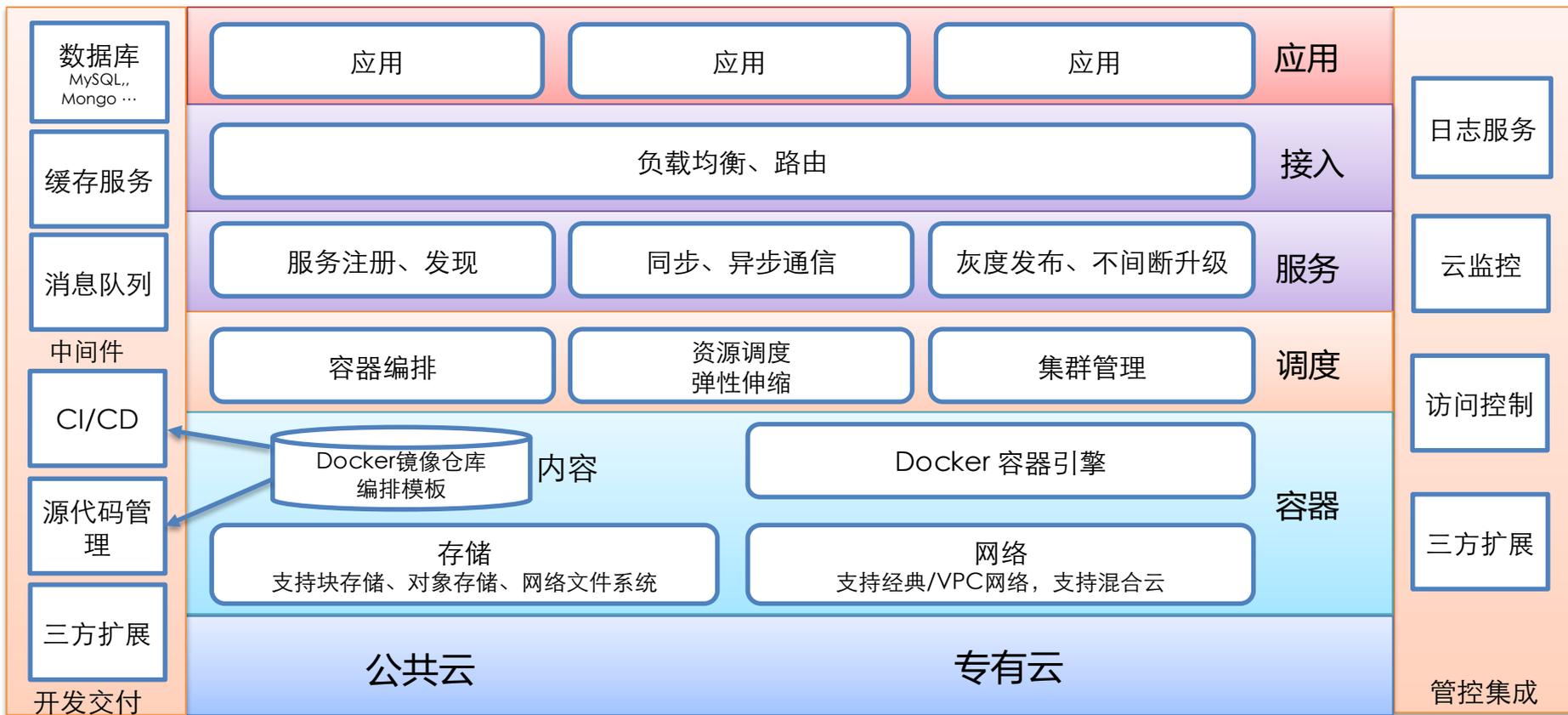
使用容器技术的主要挑战



压在Docker上的N座大山

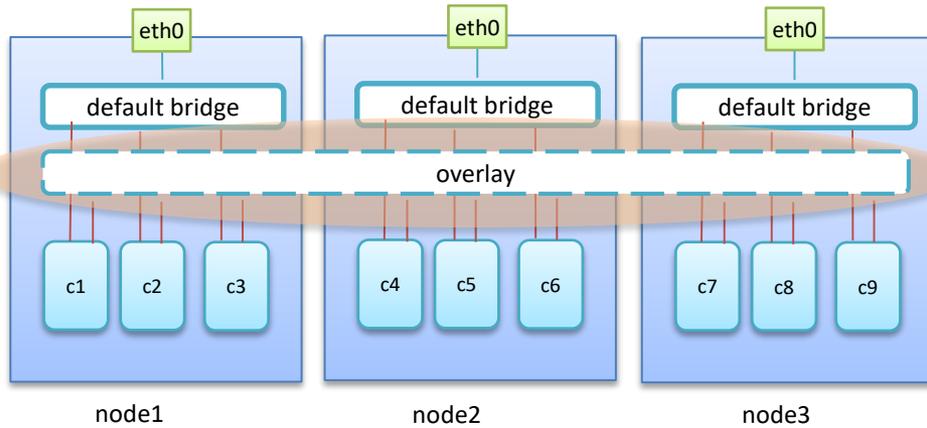
- 网络
- 存储
- 监控
- 日志
- 安全
- 微服务架构
- 持续交付
- 编程模型等等

阿里云容器服务总览

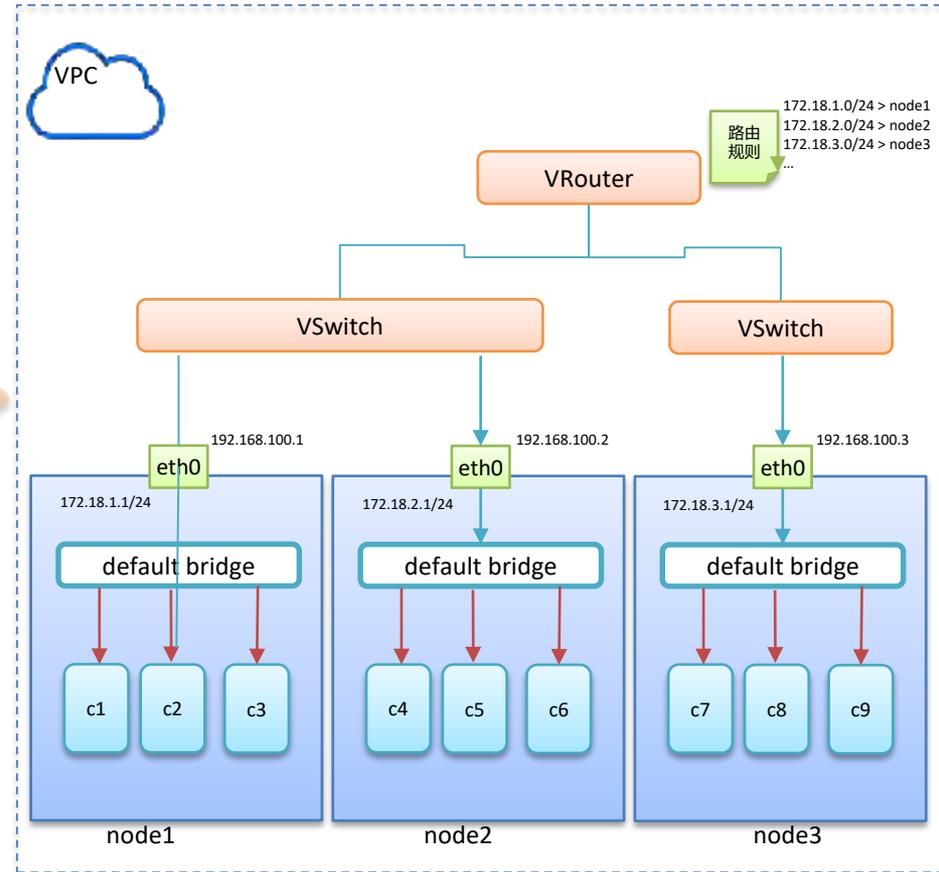


网络模型

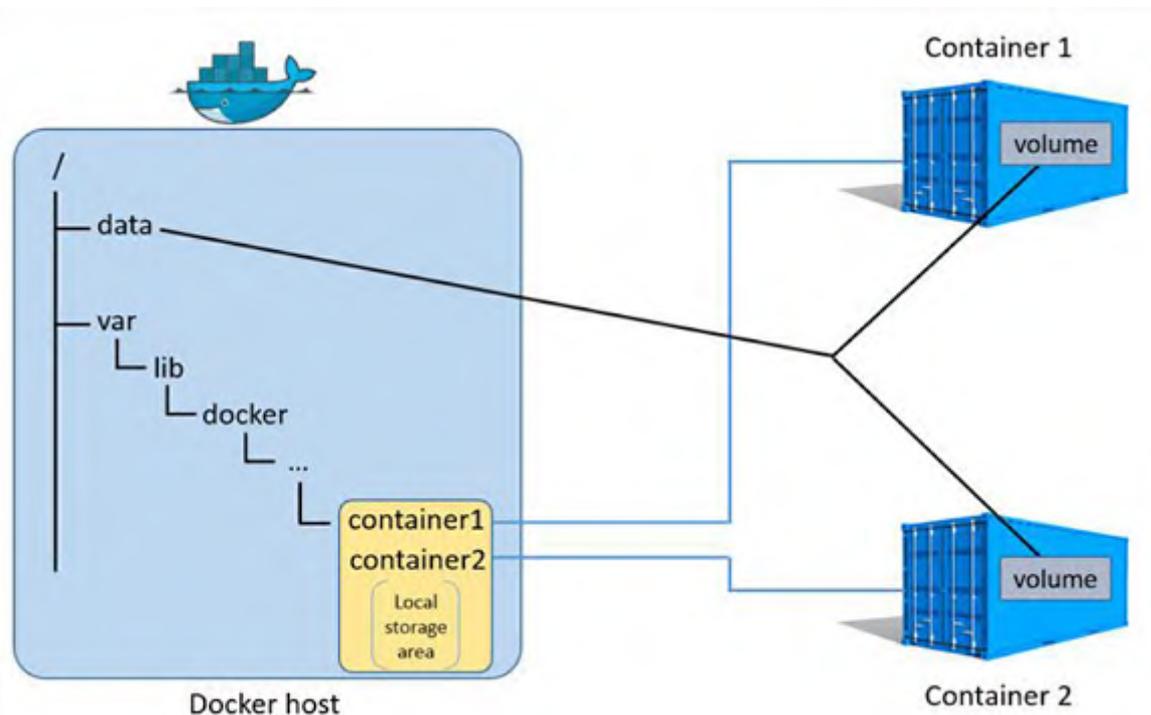
Docker 原生Overlay网络 (VXLAN)



利用VPC网络方案



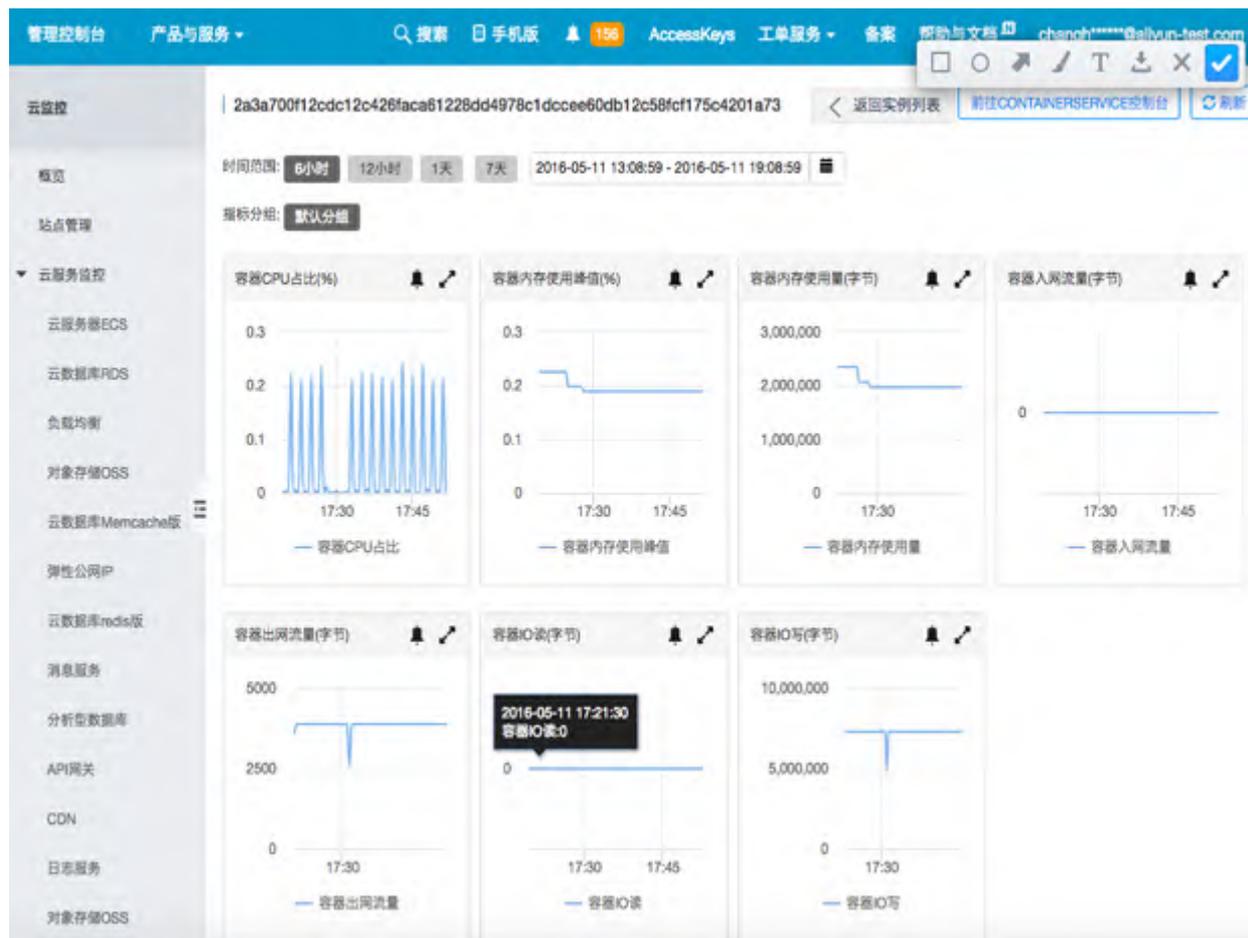
存储模型



- 数据容器
- 数据卷
 - ossfs
 - NAS
 - NFS
- 容器定义存储
 - 高密度
 - 容器级别的备份
 - 快照、恢复

容器监控

- 容器服务提供了集成的容器监控方案与与云监控无缝集成
- 资源，容器，服务，应用 多维度监控与聚合
- 自定义监控与报警



自定义监控与告警

简单开发的监控

Aliyun 扩展会根据标签来收集和聚合监控数据及日志数据

```
aliyun.monitoring.script : /opt/mp.sh
aliyun.logs : /var/log/mysql/
```

插件机制支持采集及集成扩展

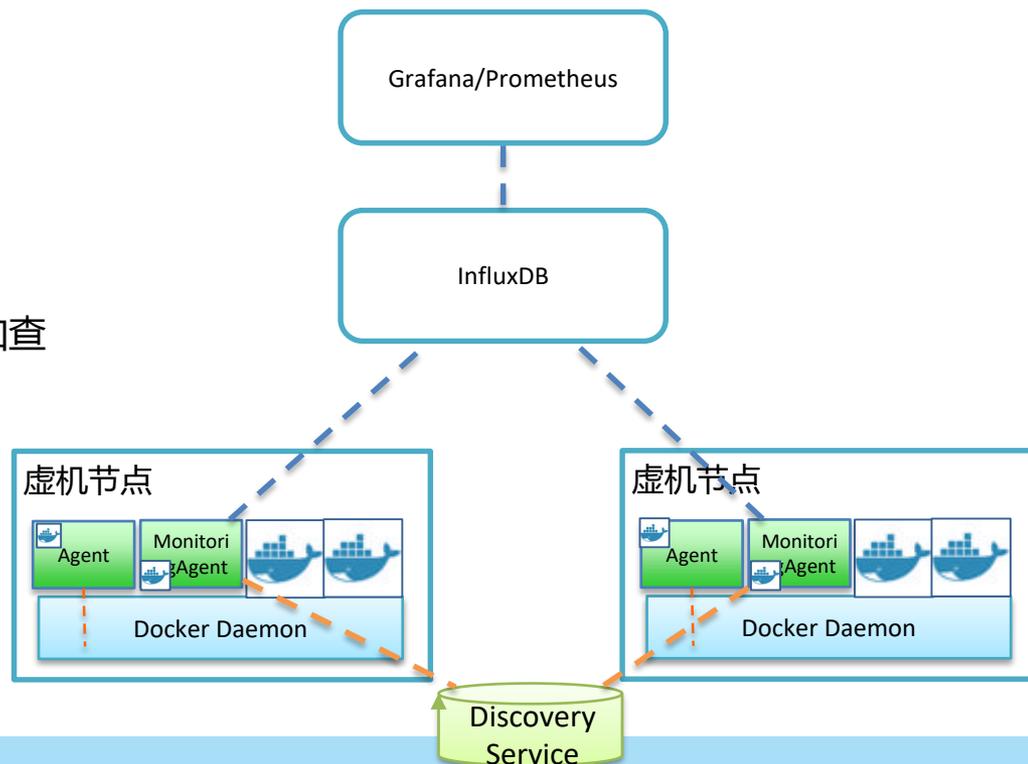
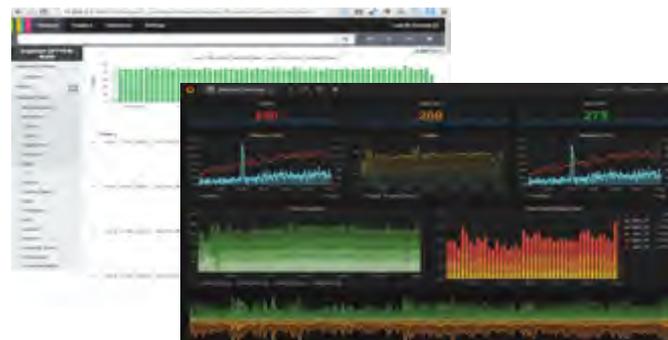
内置阿里云云监控集成

支持三方扩展

```
aliyun.monitoring.addone.influxdb :
```

开源监控方案集成

- 在每个节点上进行监控指标数据采集
- InfluxDB 负责收集汇总监控指标数据，和查询
- Grafana/Prometheus 来展现监控指标



日志服务

- Container logging support
 - Stdout/Stderr
 - Log directories defined in label
`aliyun.logs:/var/log/mysql/`
- 容器服务与SLS无缝集成

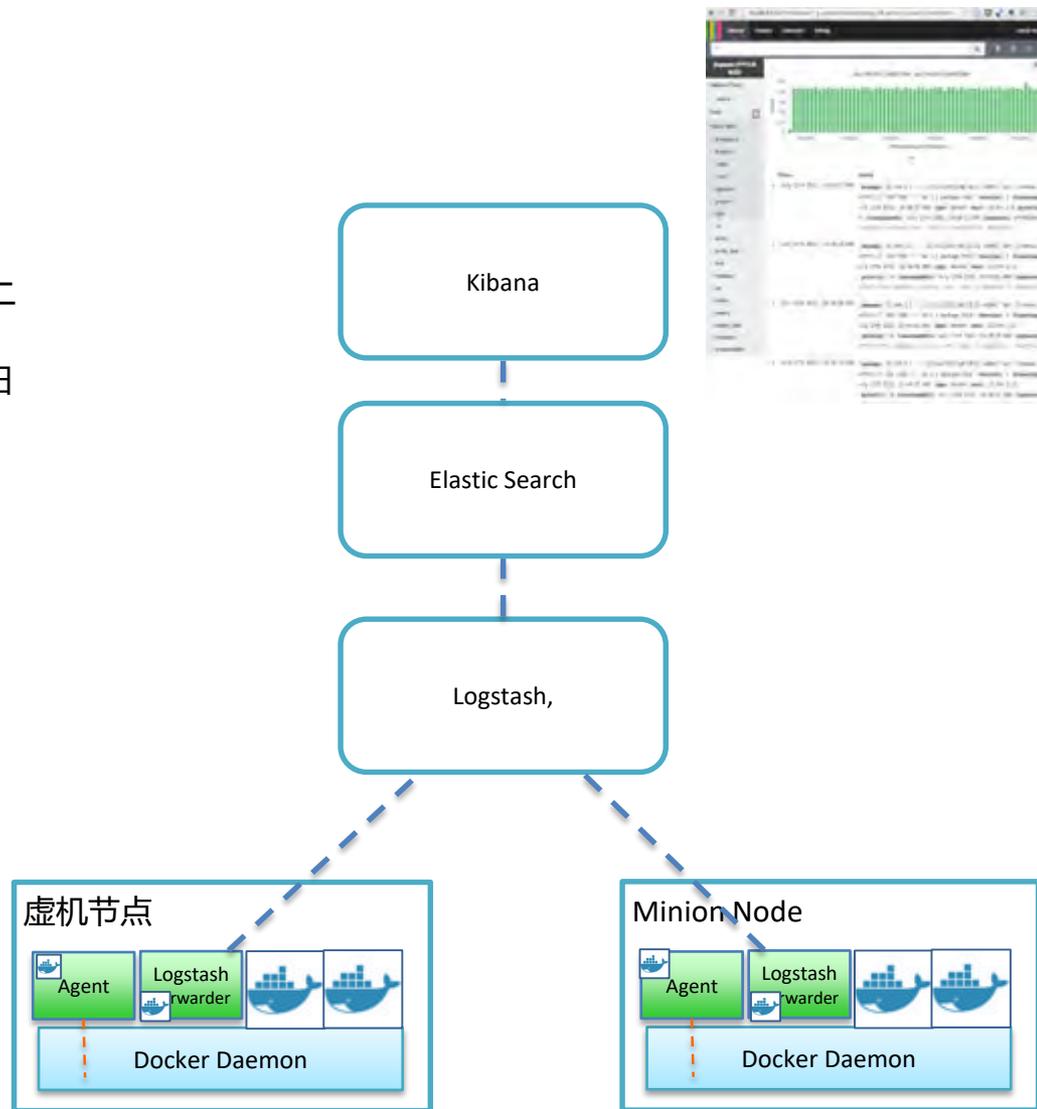


匹配日志

时间	内容
18年03月25日 14时47分00秒	content:2016-03-25T06:41:50.056359766Z WordPress not found in /var/www/html - copying now...
10.116.115.77	
18年03月25日 14时47分00秒	content:2016-03-25T06:41:50.196299036Z Complete! WordPress has been successfully copied to /var/www/html
10.116.115.77	
18年03月25日 14时47分00秒	content:2016-03-25T06:41:55.679696145Z AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.64.0.4. Set the 'ServerName' directive globally to suppress this message
10.116.115.77	
18年03月25日 14时47分00秒	content:2016-03-25T06:41:55.695668686Z AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.64.0.4. Set the 'ServerName' directive globally to suppress this message
10.116.115.77	
18年03月25日 14时47分00秒	content:2016-03-25T06:41:55.714045715Z [Fri Mar 25 06:41:55.713945 2016] [mpm_prefork:notice] [pid 1] AH0163: Apache/2.4.10 [Debian] PHP/5.6.19 configured -- returning normal operations

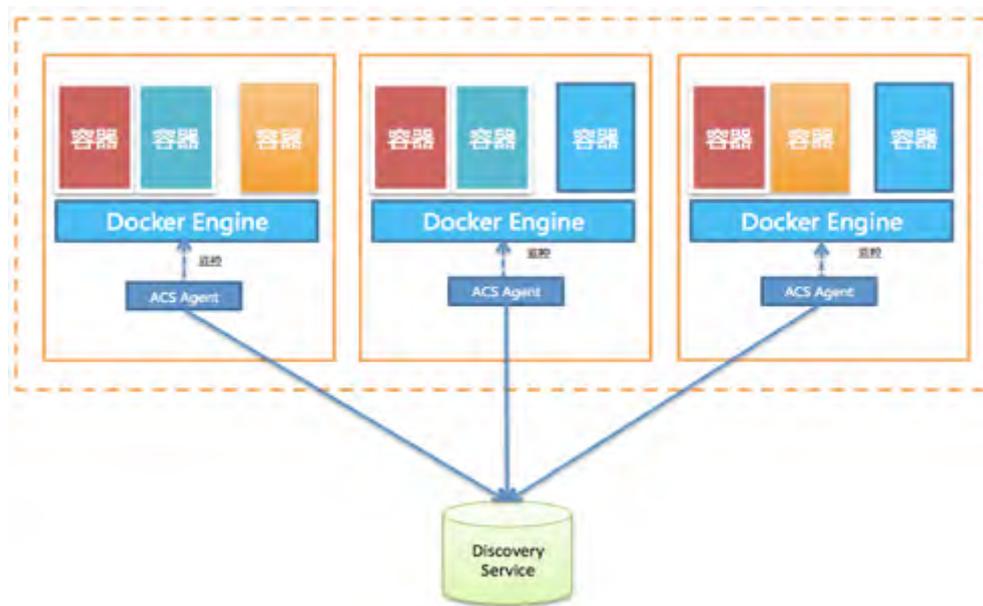
简单灵活的容器应用的日志收集

- 允许用户定制集成自己的日志服务
- E.g. 基于开源ELK 日志方案
 - 以Compose template方式部署
 - Logstash agent 会被安装在每个虚拟机节点上对日志收集
 - Aliyun 扩展会根据镜像标签来收集和聚合日志数据
 - ELK 会进行日志的处理，索引归档和查询



容器服务

自动服务注册
自动服务发现
编排支持



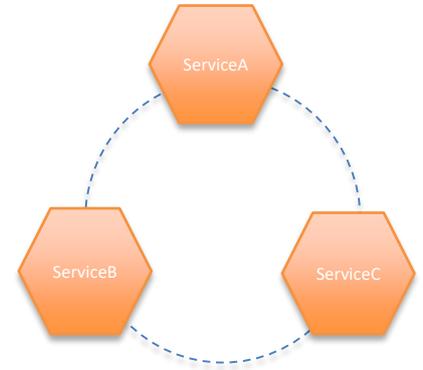
微服务架构之服务发现

linking with DNS
alias

ServiceB:myservice

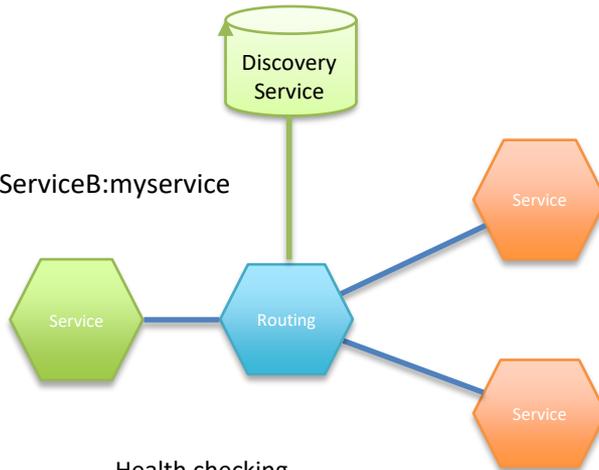


DNS alias



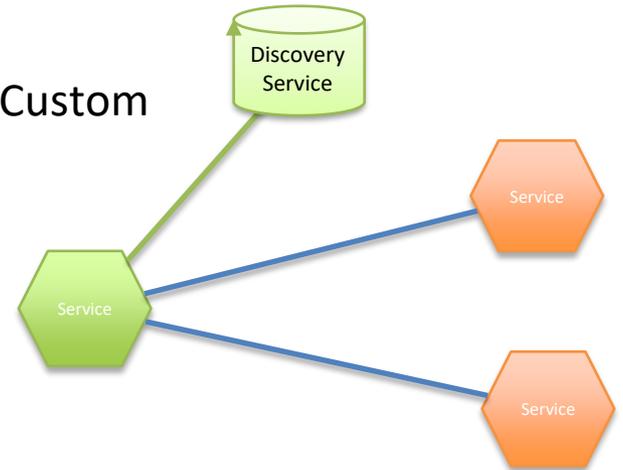
Linking with load
balancing

ServiceB:myservice



Health checking
Sophisticate load balancing

Custom

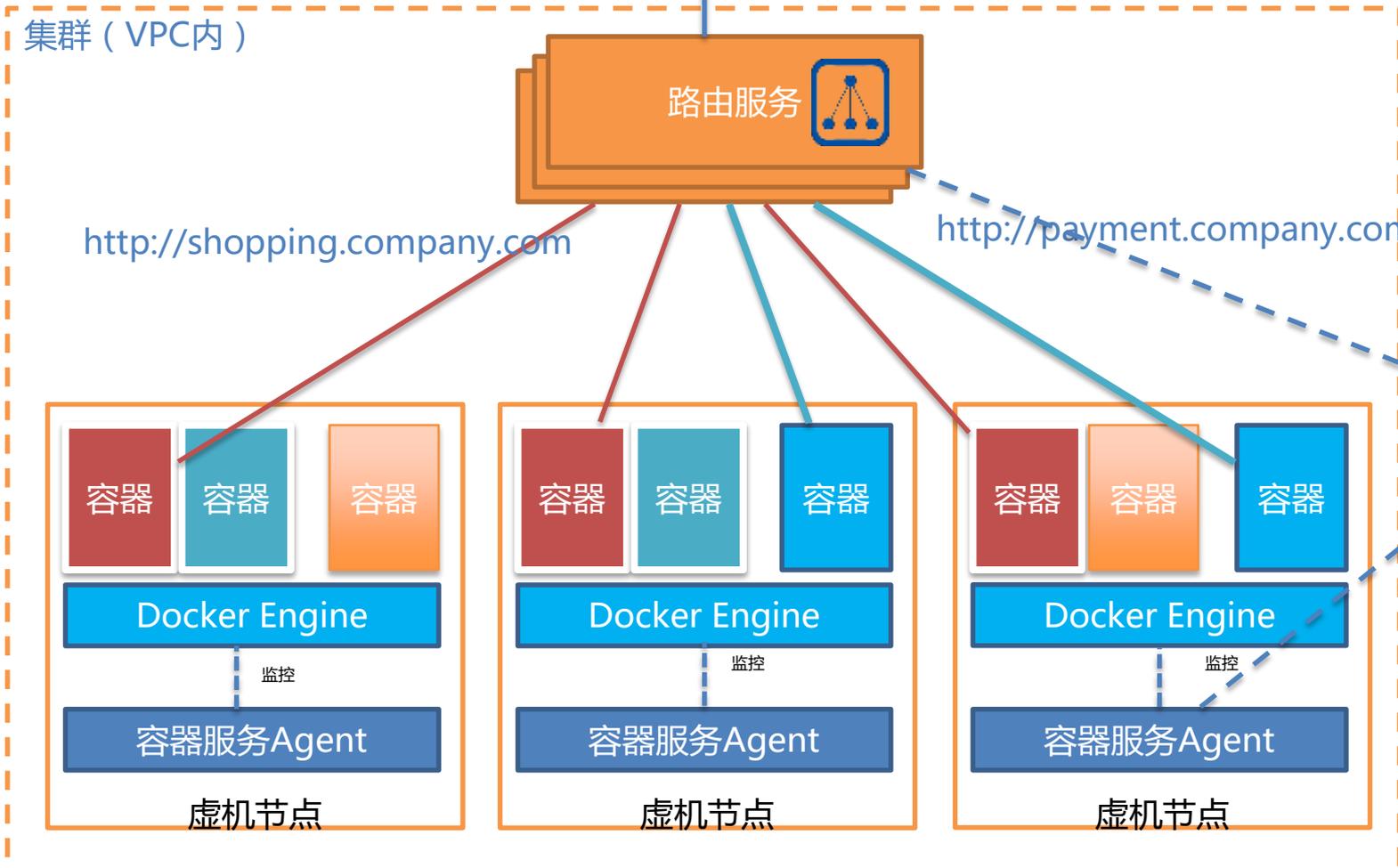


容器服务弹性路由

http://*.company.com



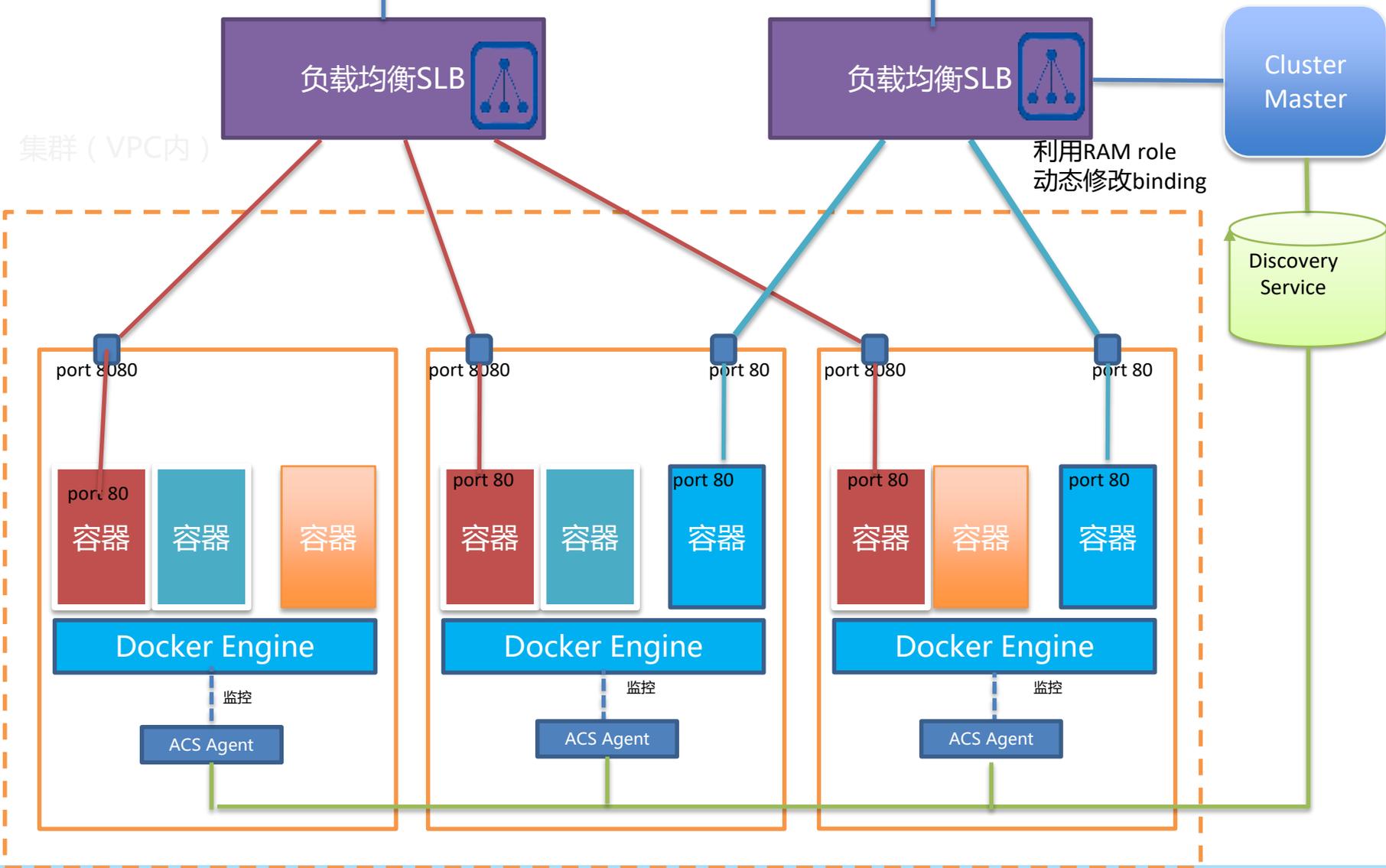
Labels:
aliyun.routing.port_80:
http://shopping.company.com



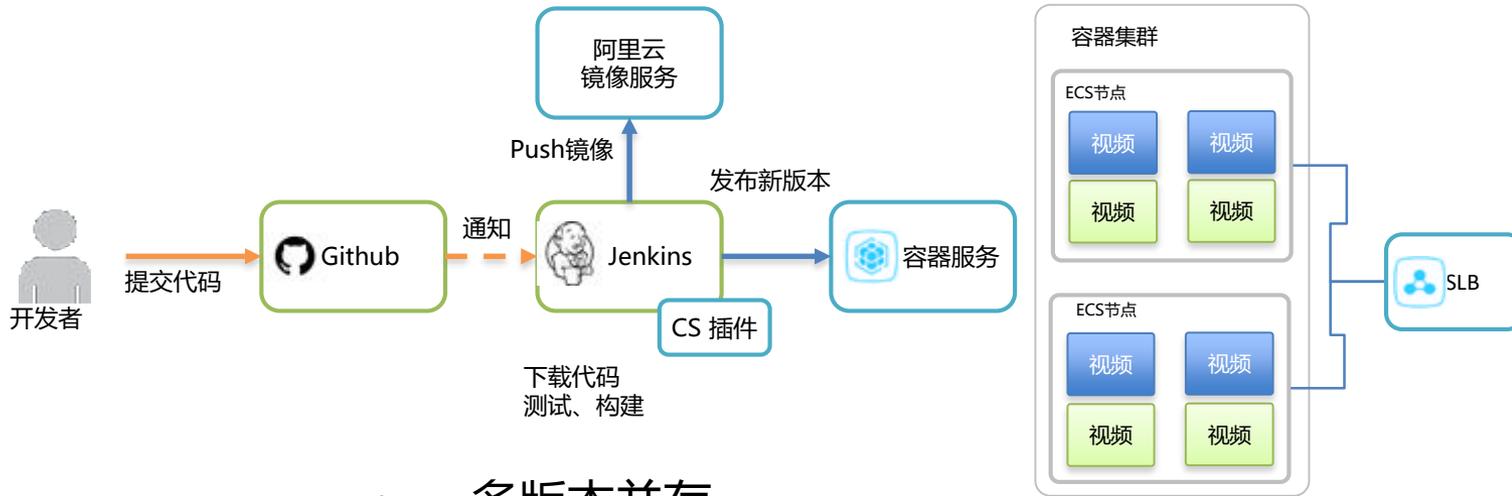
弹性Web路由方案2

http://shopping.company.com

http://payment.company.com

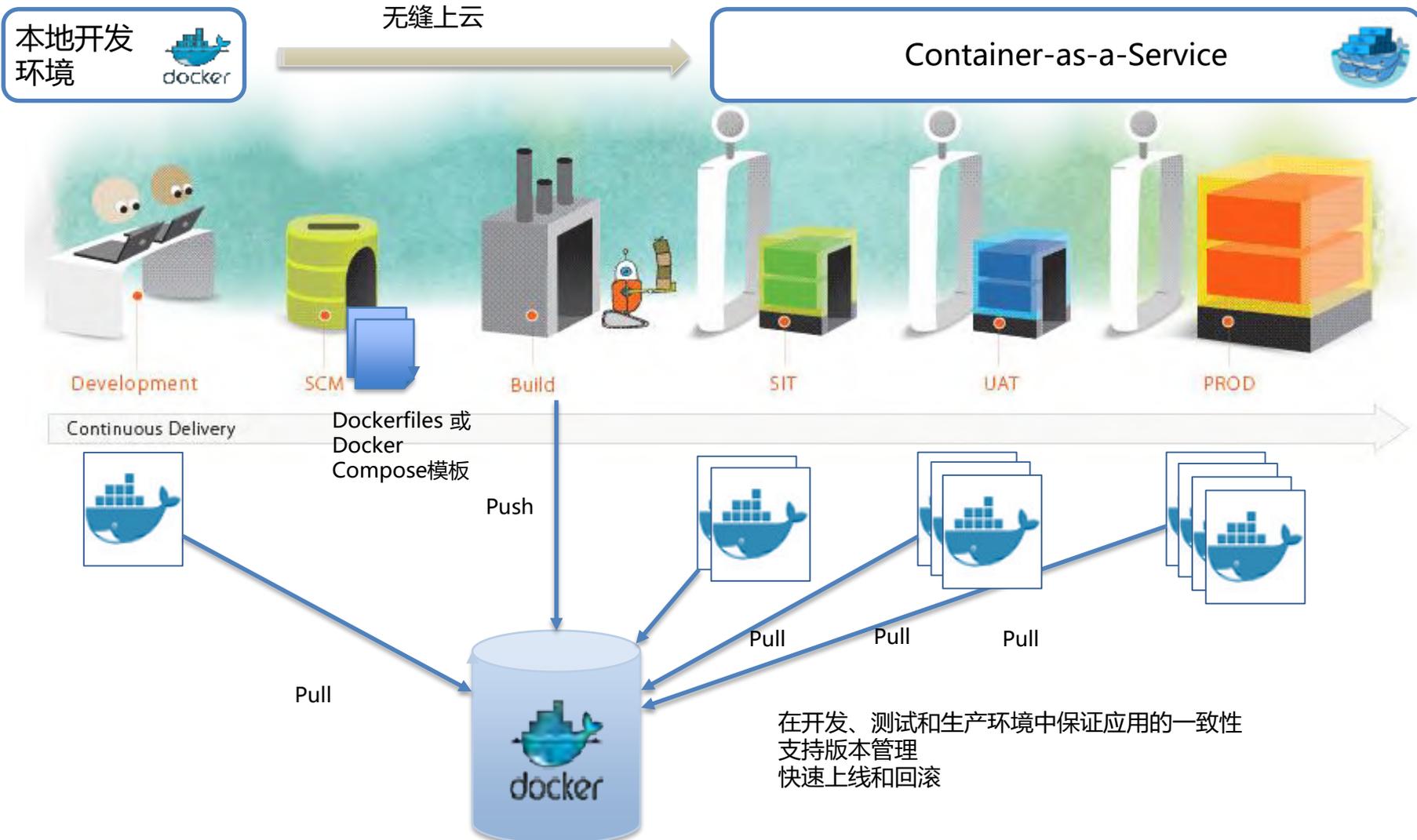


蓝绿发布Demo



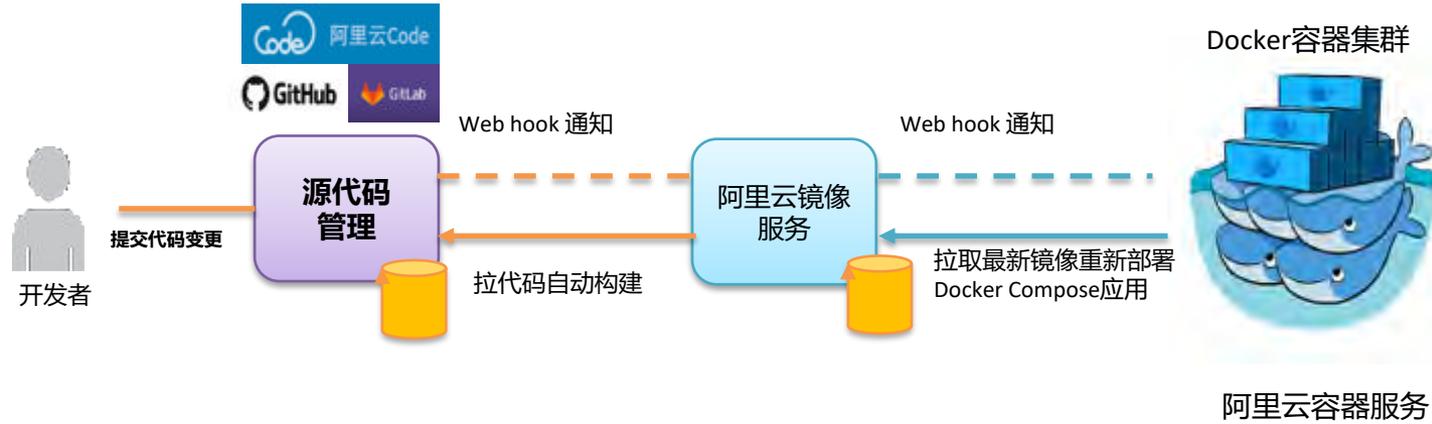
- 多版本并存
- 流量动态切换
- 快速上线、回滚

利用容器实现持续集成和交付 : Build Once and Deploy Everywhere

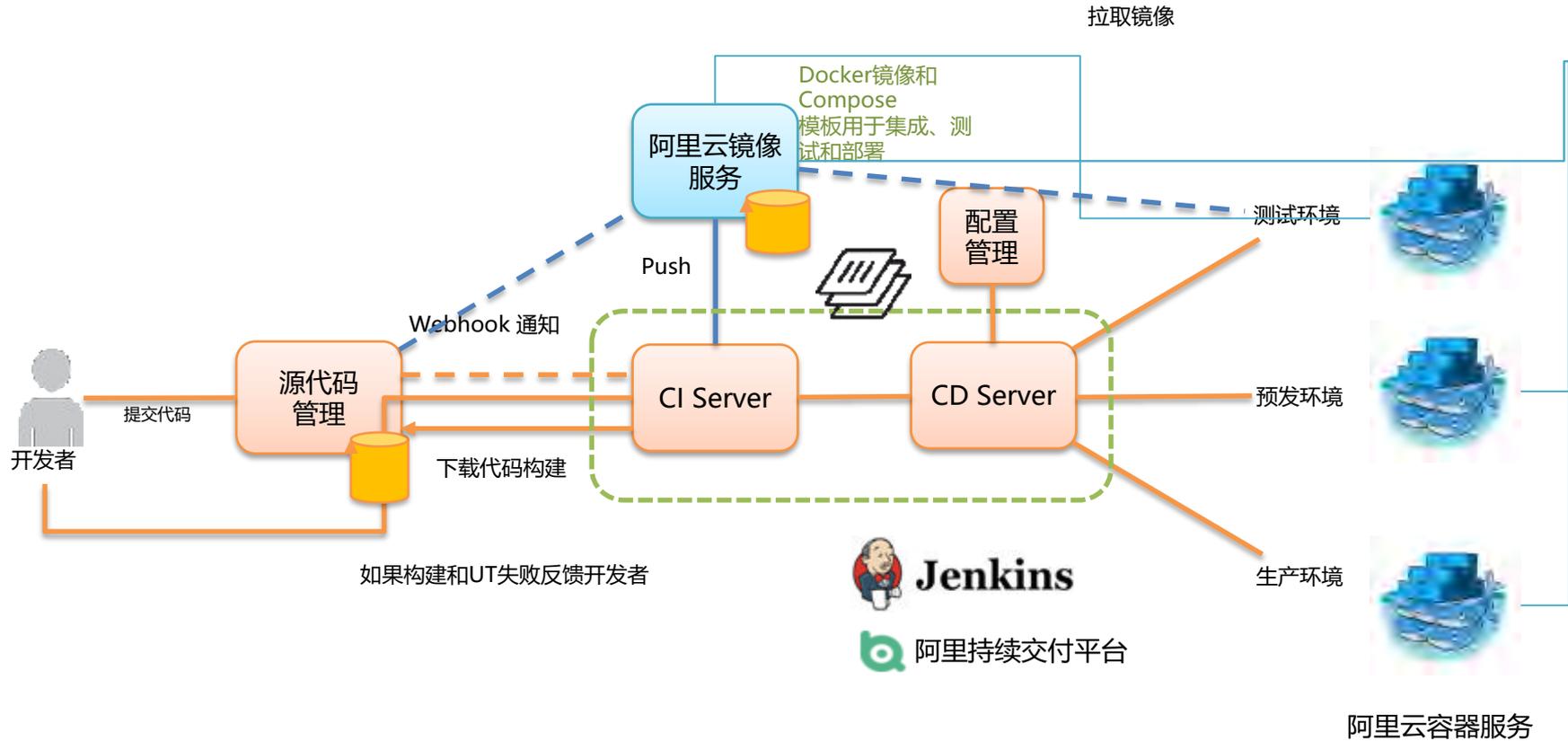


利用Docker镜像实现软件交付

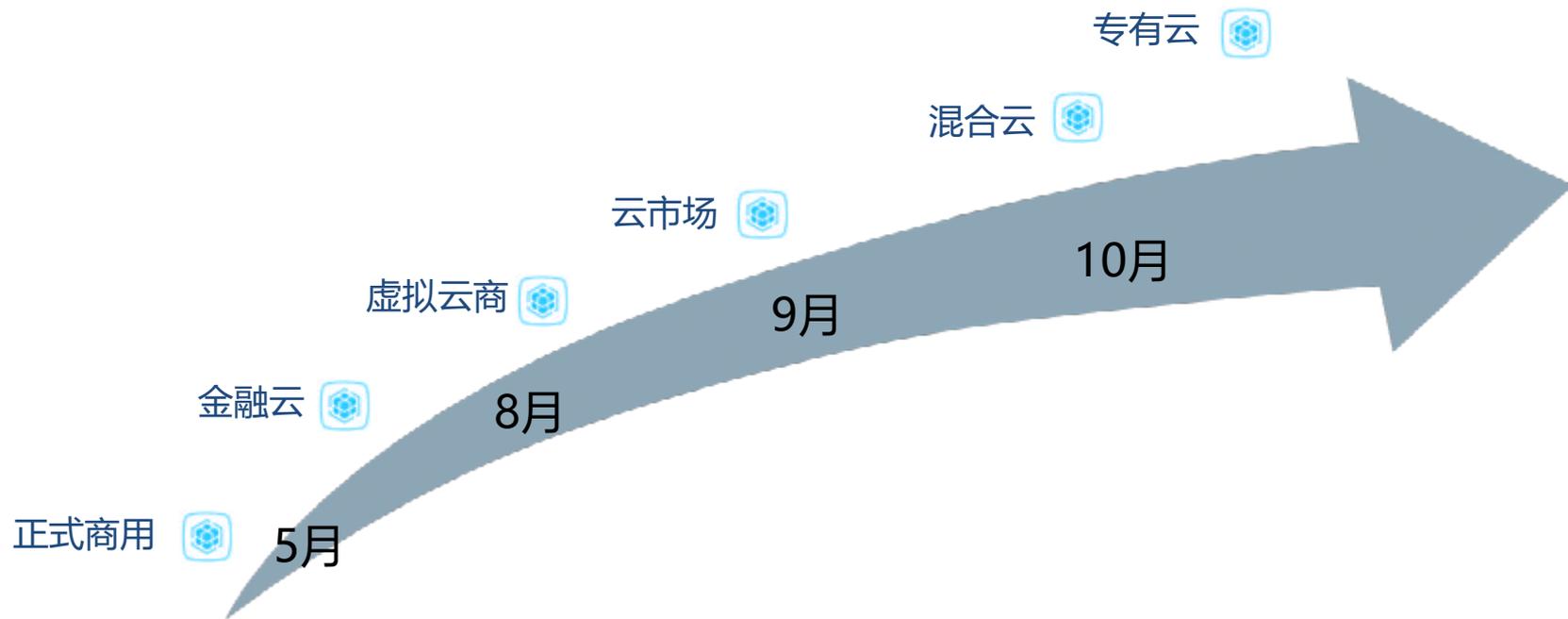
简单的持续交付流程



完整的持续交付流程



容器服务进化

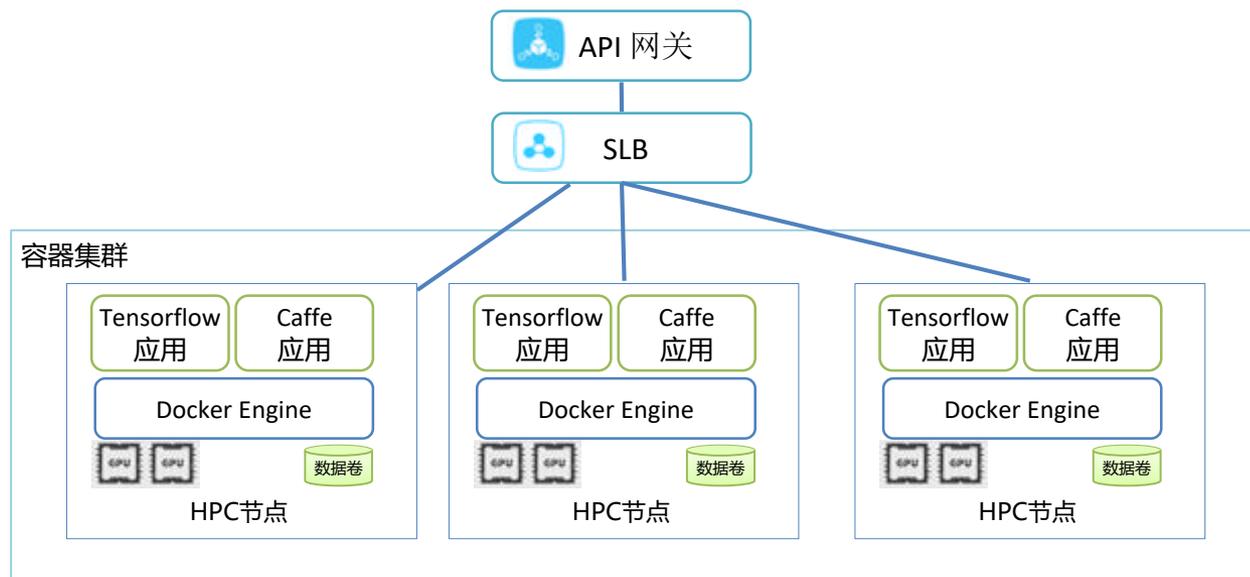


基于HPC 深度学习解决方案

```
version: '2'
services:
  inception:
    image: acs_sample/inception:demo
    volumes:
      - inception_model/inception_model
    labels:
      - aliyun.gpu=2
      - aliyun.log_store_inception=stdout
      - aliyun.lb.port_9000=tcp://inception:9000
    ports:
      - "9000:9000"
volumes:
  inception_model:
    driver: nas
```

释放HPC威力

- 快速创新，持续进化
- 打通从学习到服务价值链路



阿里云服务



阿里云Docker合作

OSS

国内被唯一官方
支持云存储后端

ECS

开源ECS Driver for
Docker Machine

10+

Docker代码贡献者

Mirror

Docker Hub 加速器
Docker Engine 镜像站点



阿里云将为Docker Hub提供中国运营的基础服务

阿里云为Docker Engine商用版以及Docker Datacenter提供销售和支持服务

Docker官方支持阿里云作为云平台



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谢谢！

混合云的支持

