

300人研发团队在开发运维上的 具体问题分享

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eHealth

- 在线保险平台
- 美国健康险里的“亚马逊”
- 工程师近300人
- 2006年纳斯达克上市
- EHTH , 7.48->27.5

eHealth



议程

- 为何开发跟运维分离
- 部署的问题
 - 啥问题？啥方案？踩了啥坑？结果？
- 测试服务器的问题
- 产品环境服务器的问题
- 技术变革的非技术因素

招人就像找对象 如果要求太多



开发VS运维



问题一：部署

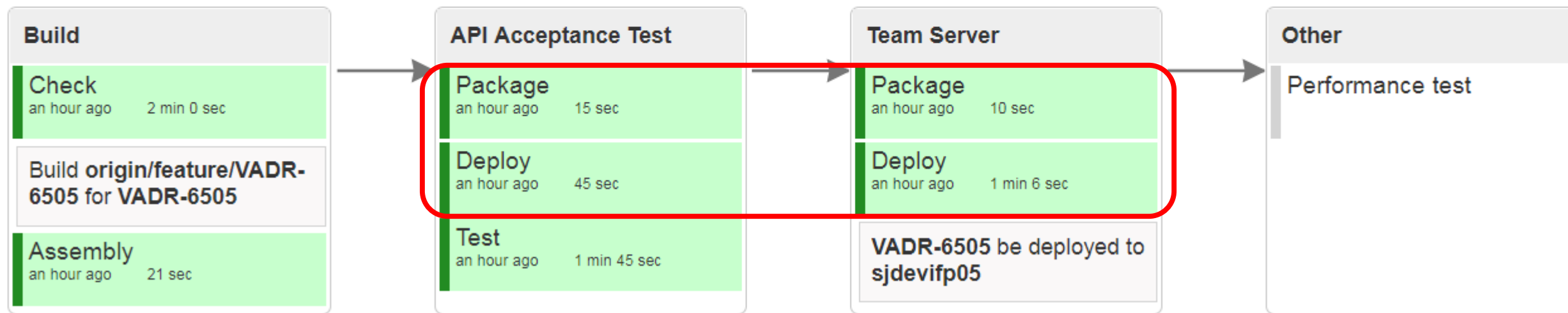
啥问题？

Backend Team Servers

I

#3746 triggered by remote trigger started an hour ago

Total build time: 6 min 25 sec




```
project: bov2-backend
description: build&deploy bov2 backend project (VM)
```

```
image: ehealth-java
```

```
env:
  - JAVA_TOOL_OPTIONS=-Dfile.encoding=UTF8
```

```
script:
  - yum install apache-tomcat-7.0.54 -y
  - ln -s /data/apache-tomcat-7.0.54 /data/tomcat
```

```
build:
```

```
scripts:
```

- gitp <https://git.ehealthinsurance.com/scm/bo/bov2-conf.git> {@confBranch}}
- gitp <https://git.ehealthinsurance.com/scm/bo/bov2-resources.git> {@resBranch}}
- mvn versions:set -DnewVersion={@jarVersion} -s {@.gitWorkspace}/bov2-conf/{@confEnv}/maven/set
- mvn clean deploy -s {@.gitWorkspace}/bov2-conf/{@confEnv}/maven/settings.xml onlyif(CM)
- mvn clean deploy -s {@.gitWorkspace}/bov2-conf/{@confEnv}/maven/settings.xml -Dmaven.test.skip o
- mvn clean package -s {@.gitWorkspace}/bov2-conf/{@confEnv}/maven/settings.xml -Dmaven.test.skip
- cp -rf {@.gitWorkspace}/bov2-conf .
- cp -rf {@.gitWorkspace}/bov2-resources .

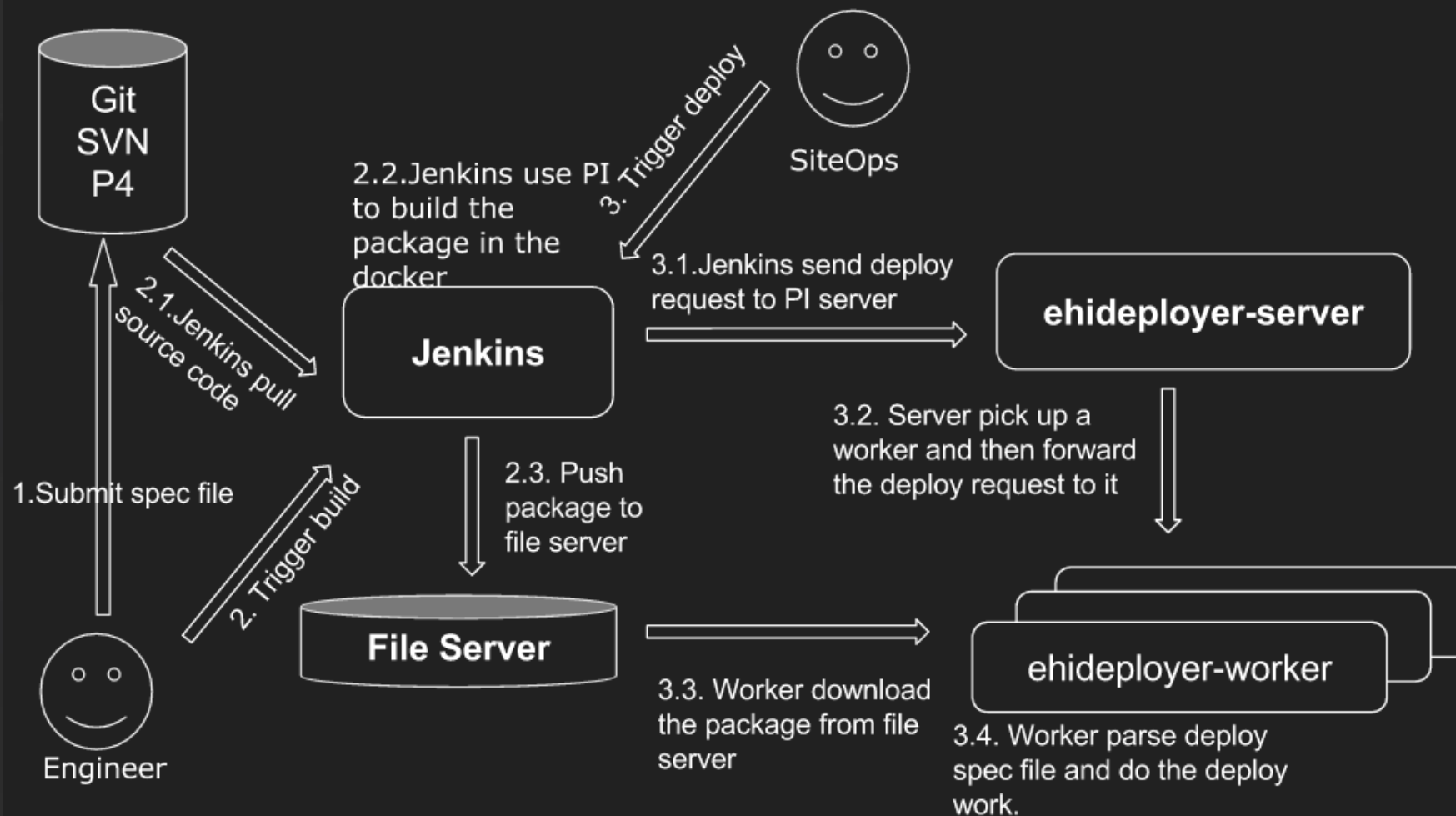

```

deploy:
  tomcat:
    spec:
      virtualmachines:
        name:
          - {@tomcatServer}}
        instances: a,b
        before:
          - rm -rf /data/resources/properties/*
      customize:
        before:
          scripts:
            - push {@.workDir}}/bov2-conf/{@confEnv}}/keyman/ /data/keyman/
            - push {@.workDir}}/bov2-conf/{@confEnv}}/resources/certs/ /data/resources/certs/
            - push {@.workDir}}/bov2-conf/{@confEnv}}/tomcat/bin/ /data/tomcat/bin/
            - push {@.workDir}}/bov2-conf/{@confEnv}}/tomcat/lib/ /data/tomcat/lib/
            - push {@.workDir}}/bov2-conf/{@confEnv}}/tomcat/endorsed/ /data/tomcat/endorsed/

  memcached:
    spec:
      virtualmachines:
        name:
          - {@memcachedServer}}
        scripts:
          - "ps -ef|grep 'wlsuser'|grep 'bin/memcached'|grep -v 'grep'|awk '{print $2}'| xargs --no-run-if-
          - "instance=`hostname | awk -F. '{print $1}'`a;/data/memcached/bin/memcached -d -l $instance -p 1
          - "instance=`hostname | awk -F. '{print $1}'`b;/data/memcached/bin/memcached -d -l $instance -p 1

```

PI build & deploy workflow



提交Spec

Jenkins

起docker

构建

部署

技术栈

1. Go
2. Jenkins
3. Docker
4. SafeNet
5. Seaweedfs
6. YAML

结果



踩了啥坑

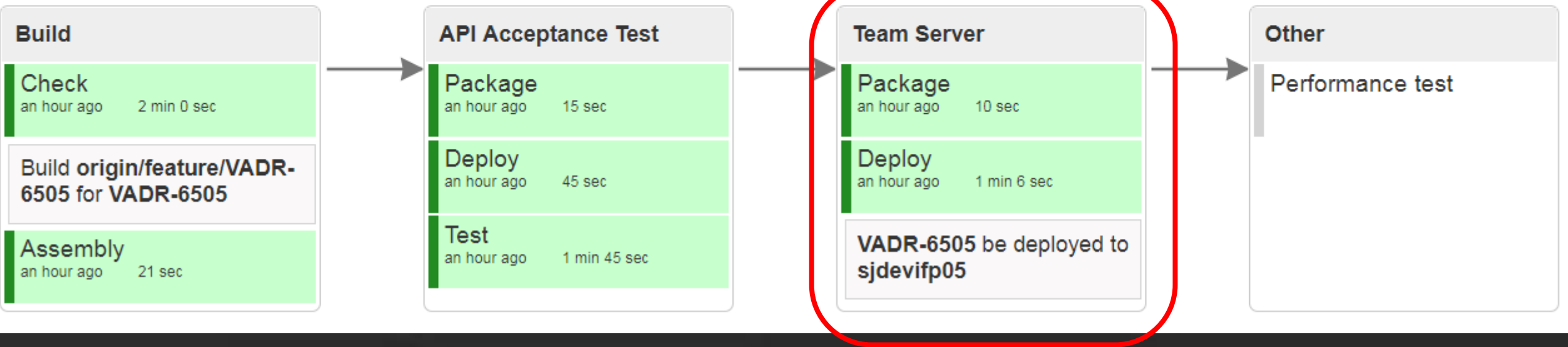
- 部门配合
- 上线艰难
- 自己做了轮子

问题二：测试服务器

Backend Team Servers

I
 #3746 triggered by remote trigger started an hour ago

Total build time: 6 min 25 sec



啥问题？



```
project: muse
description: This is a spec for deploy muse project to our servers
image: ehealth-nodejs
domain: muse01
build:
  scripts:
    - npm install
    - grunt --allow-root
deploy:
  apache:
    spec:
      containers:
        name:
          - museweb01
        image: ehealth-httpd

  customize:
    rewriterule:
      http:
        - rewrite-rules-static-ehmp
      ssl:
        - rewrite-rules-static-ehmp

  before:
    - p4 sync //depot/CM/apache/TEAM25/mc/wwwconf/muse.conf
    - svnp https://xmsvn.ehealthinsurance.com/svn/ehippi/medicare/branches/preqa1/apache/rewrite/mc/
    - gitp https://git.ehealthinsurance.com/scm/pinf/projectconfig.git
    - svnp https://xmsvn.ehealthinsurance.com/svn/ehippi/medicare/branches/preqa1/wwwroot/

  scripts:
    - "push {{.svnWorkspace}}/mc/rewrite-rules-muse /data/wwwconf/"
    - "push {{.svnWorkspace}}/mc/rewrite-rules-static-ehmp /data/wwwconf/"
    - "push {{.gitWorkspace}}/projectconfig/medicare/muse/muse01/wwwconf/ /data/wwwconf/"
    - "push {{.workDir}}/target/wwwmuse/ /data/wwwmuse/"
    - "push {{.svnWorkspace}}/wwwroot/ /data/wwwroot/"
```

技术栈

1. Kubernetes
2. Flannel
3. Harbor
4. Grafana + Prometheus



Running containers

2424

Total Memory Usage

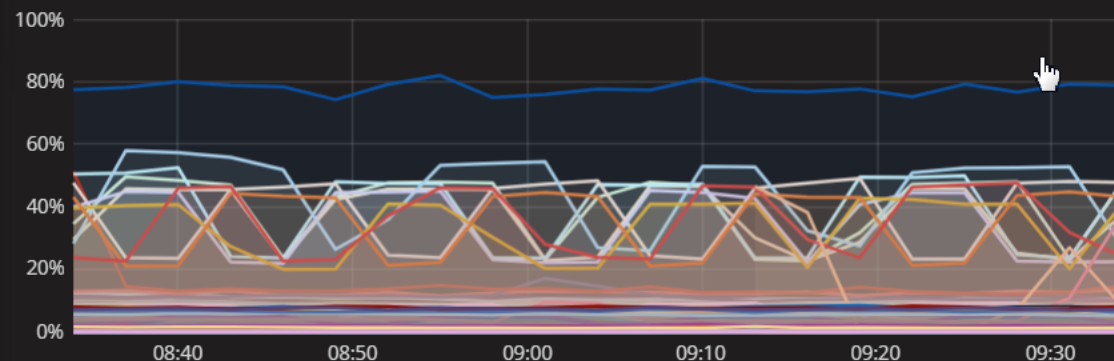
394 GiB

Total CPU Usage

1141%

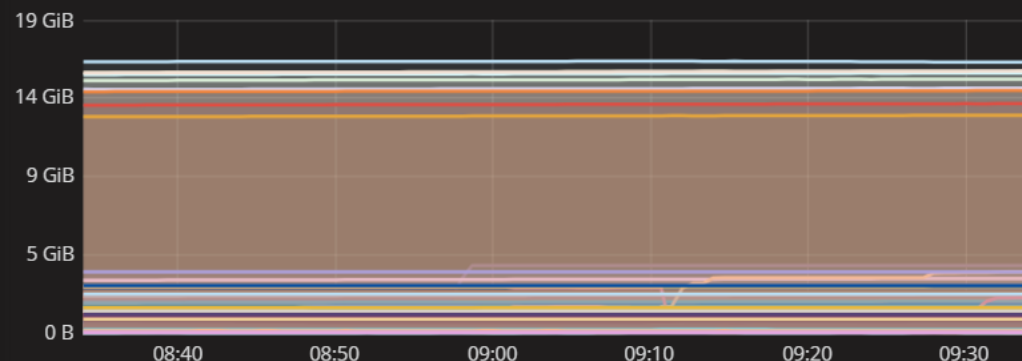
Running containers without "pause"

1846



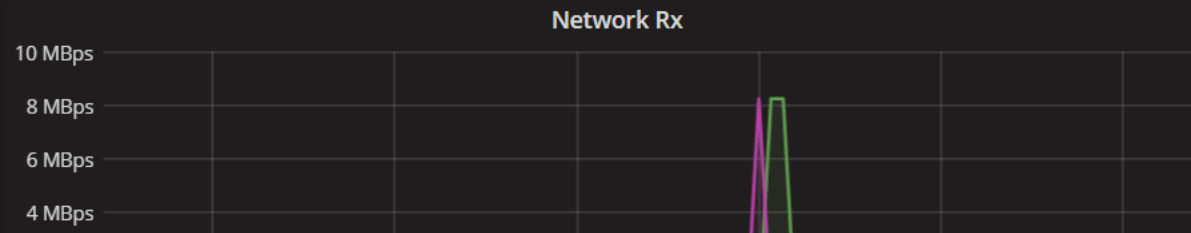
CPU Usage

	avg	current
k8s_POD.ae8ee9ac_bose1878-bose1878boseapp01-2447544492-bqy9c_pi-tomcat_a66f201e-b516-11e7-8ab4-00...	0%	0%
k8s_POD.ae8ee9ac_idm02-sjtsidmweb02-3717680658-r8p8y_pi-apache_9c4c81ef-afbc-11e7-8468-0050568c7980...	0%	0%
k8s_POD.ae8ee9ac_medi14832-ehmp-app-3503062901-qtate_pi-tomcat_335c711c-99f3-11e7-8468-0050568c798...	0%	0%
k8s_POD.ae8ee9ac_mcdrugtoolqa02git-sjqamdtapp01-2880718734-3r0n7_pi-tomcat_72dddab1-a3fe-11e7-8468-...	0%	0%
k8s_POD.ae8ee9ac_fsis2412-fsis2412rrsweb01-1029397475-ojvd9_pi-apache_e8b11e72-bd50-11e7-8ab4-005056...	0%	0%
k8s_POD.ae8ee9ac_bkof7420-bkof7420bov2app01-4259571001-90ou1_pi-tomcat_0ae90070-b3ab-11e7-8ab4-00...	0%	0%
k8s_POD.ae8ee9ac_medi14788-muse-web-2384874885-chvn6_pi-apache_9677c7b9-9545-11e7-8468-0050568c79...	0%	0%
k8s_POD.ae8ee9ac_pccmgit-sjcmpcapp01a-2123035817-nvsus_pi-tomcat_162ede83-bd3b-11e7-8ab4-0050568c7...	0%	0%
k8s_POD.ae8ee9ac_bond932-bond932boseapp01-3658518172-dbks8_pi-tomcat_32834bc4-9d09-11e7-8468-005...	0%	0%

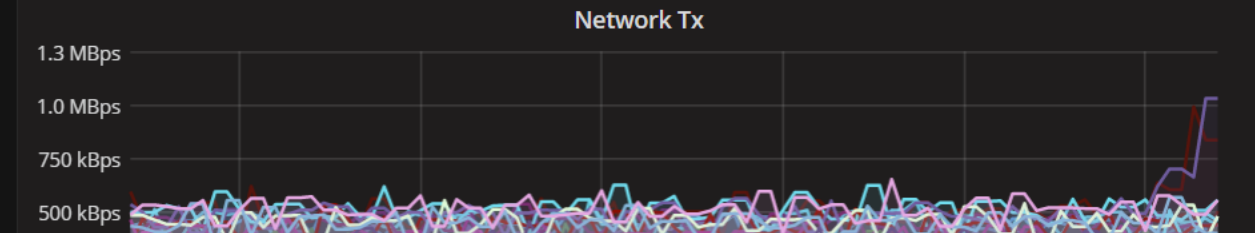


Memory Usage

	avg	current
k8s_POD.ae8ee9ac_bose1878-bose1878boseapp01-2447544492-bqy9c_pi-tomcat_a66f201e-b516-11e7-8ab4-00...	440.35 KiB	436.00 KiB
k8s_POD.ae8ee9ac_idm02-sjtsidmweb02-3717680658-r8p8y_pi-apache_9c4c81ef-afbc-11e7-8468-0050568c7980...	608.00 KiB	608.00 KiB
k8s_POD.ae8ee9ac_medi14832-ehmp-app-3503062901-qtate_pi-tomcat_335c711c-99f3-11e7-8468-0050568c798...	479.52 KiB	460.00 KiB
k8s_POD.ae8ee9ac_mcdrugtoolqa02git-sjqamdtapp01-2880718734-3r0n7_pi-tomcat_72dddab1-a3fe-11e7-8468-...	1.43 MiB	1.43 MiB
k8s_POD.ae8ee9ac_fsis2412-fsis2412rrsweb01-1029397475-ojvd9_pi-apache_e8b11e72-bd50-11e7-8ab4-005056...	1.44 MiB	1.44 MiB
k8s_POD.ae8ee9ac_bkof7420-bkof7420bov2app01-4259571001-90ou1_pi-tomcat_0ae90070-b3ab-11e7-8ab4-00...	1.24 MiB	1.24 MiB
k8s_POD.ae8ee9ac_medi14788-muse-web-2384874885-chvn6_pi-apache_9677c7b9-9545-11e7-8468-0050568c79...	996.40 KiB	980.00 KiB
k8s_POD.ae8ee9ac_pccmgit-sjcmpcapp01a-2123035817-nvsus_pi-tomcat_162ede83-bd3b-11e7-8ab4-0050568c7...	444.00 KiB	444.00 KiB
k8s_POD.ae8ee9ac_bond932-bond932boseapp01-3658518172-dbks8_pi-tomcat_32834bc4-9d09-11e7-8468-005...	396.00 KiB	396.00 KiB



Network Rx



Network Tx

Issue#	Modules				Action
MEDI-14538	EHM	Branch: develop	build passing	View	Destroy
	MUSE	Branch: feature/MEDI-14538	build passing	View	
	EHMP	Branch: develop	build passing	View	
	MCWS	Branch: develop	build passing	View	
MEDI-14812	MUSE	Branch: feature/MEDI-14812	build passing	View	Destroy
	EHM	Branch: develop	build passing	View	
	EHMP	Branch: qaset/qaset	build passing	View	
	MCWS	Branch: qaset/20171013	build passing	View	
MEDI-14568	EHMP	Branch: develop	build passing	View	Destroy
	MUSE	Branch: develop	build passing	View	
	MCWS	Branch: feature/MEDI-14568	build passing	View	

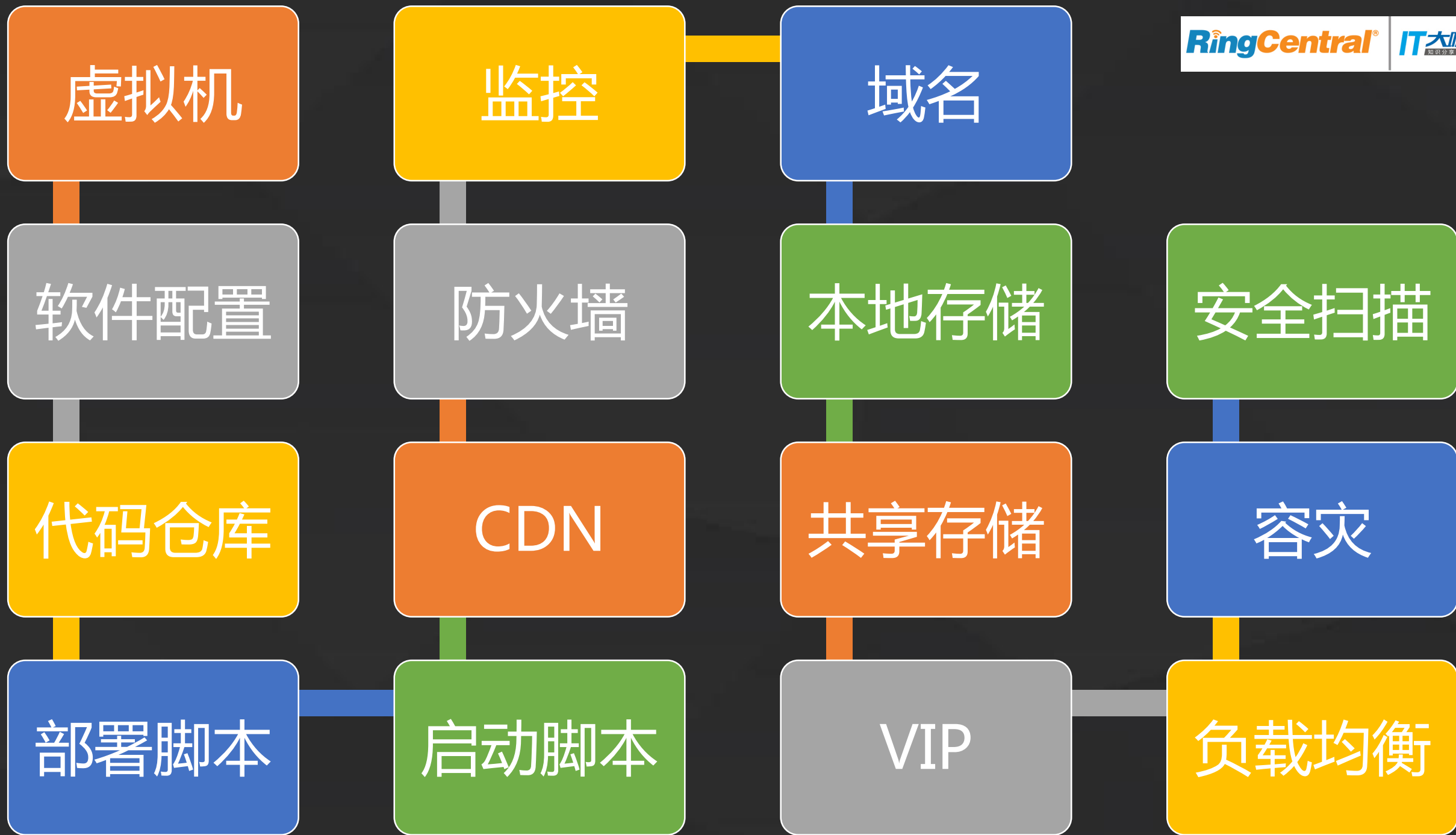
结果



踩了啥坑

- 一次构建，多次部署
- 容器编排
- 反向代理
- 自建VS开源

问题三：产品环境服务器

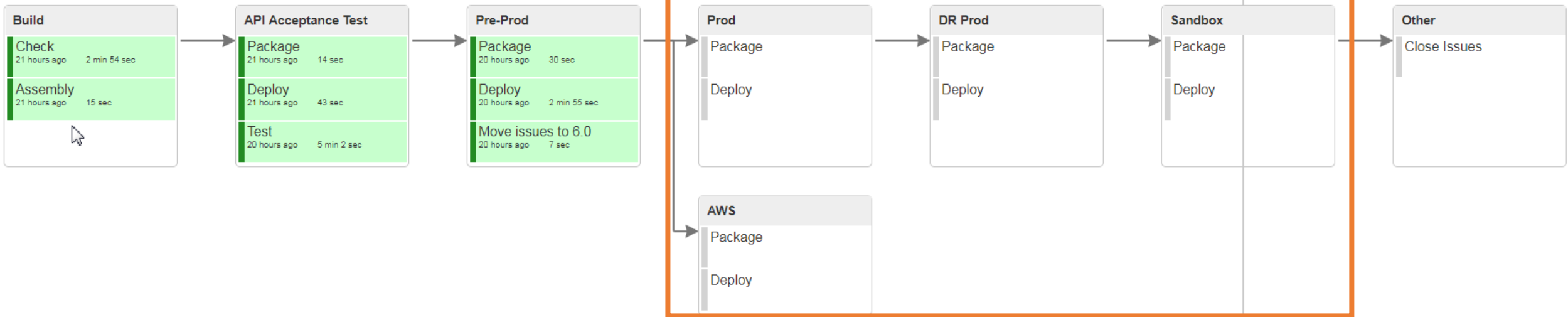


啥问题？

Backend Production

#235 triggered by user Claude Jiang started 21 hours ago

Total build time: 12 min 42 sec



问题：增加4个服务器节点



问题：打补丁



问题：发布



问题：运维事故




```
template:
```

```
- hostgroup:
```

```
  name: medicare-qa
```

```
  subnet: 'net205'
```

```
  domain: 'ehi.com'
```

```
  image_tpl: 'centos6-base'
```

```
  compute_attributes:
```

```
    cpuHotAddEnabled: true
```

```
    cpus: 2
```

```
    memoryHotAddEnabled: true
```

```
    memory_mb: 5120
```

```
    volumes_attributes:
```

```
      - datastore: 'datastore1'
```

```
        size_gb: '10'
```

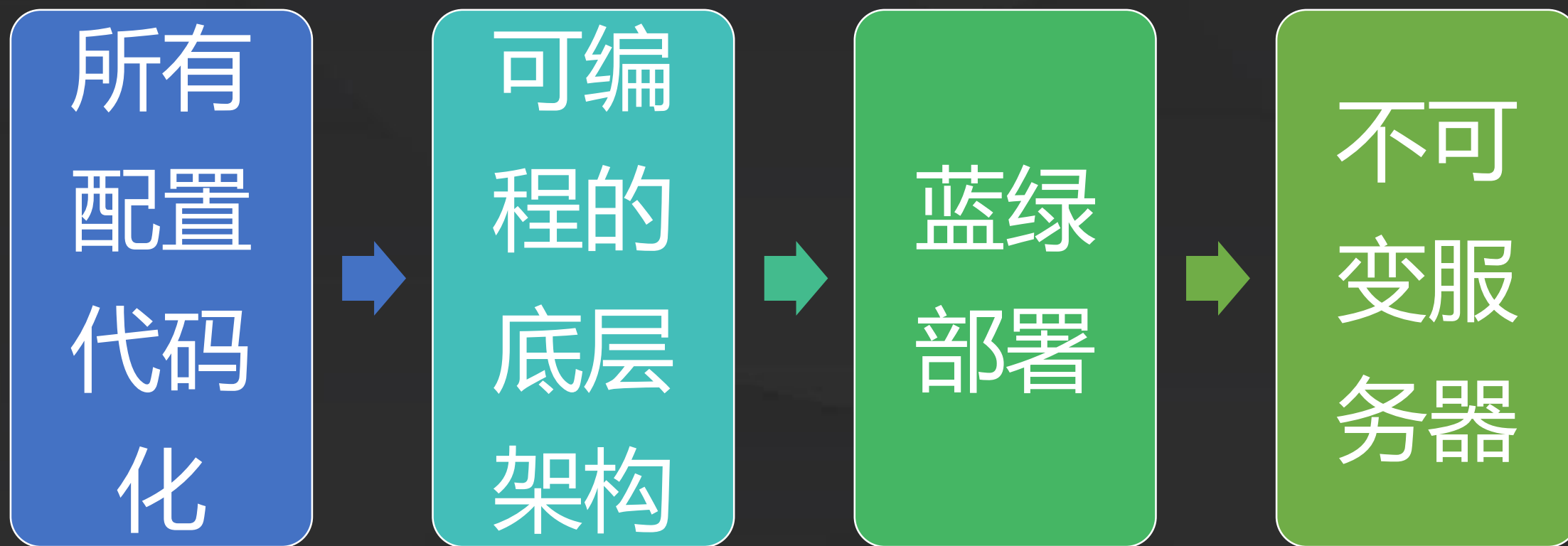
```
        name: 'hard disk'
```



2 vCPU VM
1 JVM (-Xmx 4096m)
Approx 5GB RAM Reservation

```
# ... allowed
```

目标



这意味着什么？

加节点

打补丁

发布

运维事
故

技术栈

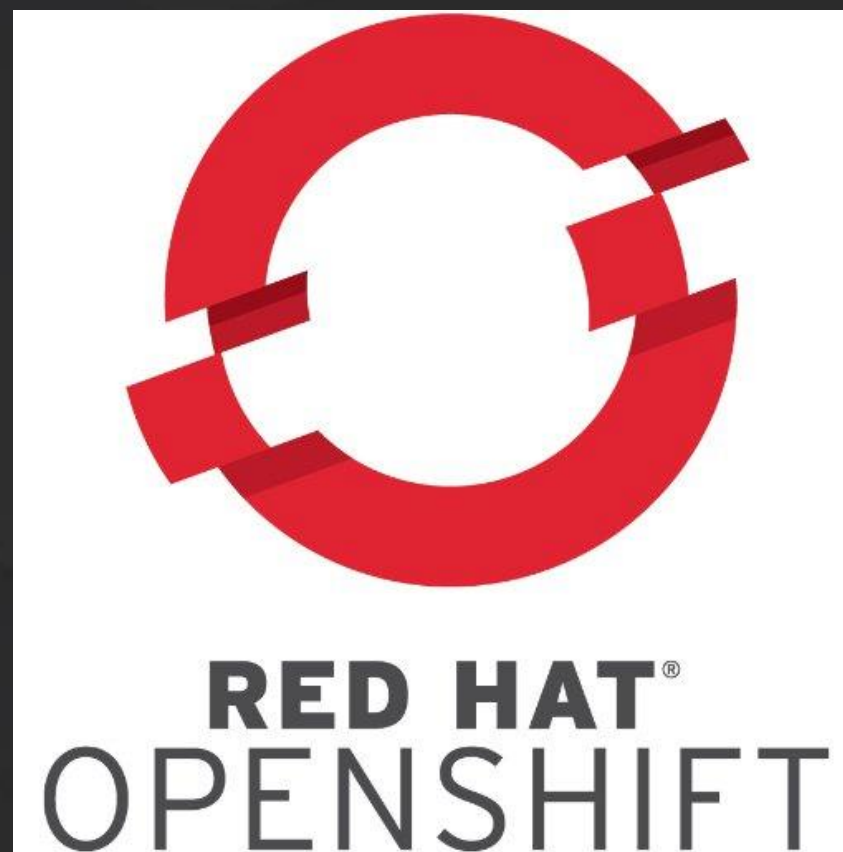
1. VMWare
2. Puppet
3. Foreman VS Terraform
4. Python VS GO

踩了啥坑

- VM笨重
- 硬件成本高
- 人员代价

换个方法

- 镜像管理
- 网络分组隔离
- 负载均衡
- 蓝绿部署
- 日志跟踪
- 监控



技术变革中的非技术因素

DevOps应该由开发部门还是运维部门来推进？

转型时传统运维人员的情绪如何顾及？

同意代表买单？

该指望技术高层提供什么样的支持？

先别提DevOps，先提自动化

要落地，就要专注在具体问题

谢谢！