

# Spring boot + Docker + Jenkins

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## 第一章 部署准备

### 1.1 目的

将 spring boot 程序做成 docker 镜像, 推送到镜像仓库, 使用 jenkins 自动部署和回滚。

### 1.2 规划

OS : CentOS\_7.5 x64  
IP : 10.1.5.64, jenkins 服务器  
172.16.6.32, harbor 搭建的 docker 私仓  
172.16.6.33, 运行程序 (jar)

三台机器均安装如下包:

**docker-ce-cli** : 18.09.0

**docker-ce** : 18.09.0

其中, 172.16.6.32 还需要部署 harbor, 参考其他文档。

## 第二章 docker 安装

操作对象：

10.1.5.64  
172.16.6.32  
172.16.6.33

安装方法有很多，这里选择其中一种，rpm 方式。

### 2.1 安装

添加 docker 源：

```
yum-config-manager --add-repo  
https://download.docker.com/linux/centos/docker-ce.repo
```

从指定源安装 docker-ce：

```
yum install docker-ce --enablerepo=docker-ce-stable -y
```

```
systemctl start docker  
systemctl enable docker
```

查看是否开机运行：

```
systemctl list-unit-files|grep docker
```

### 2.2 确认

```
docker version
```

```
[root@docker01 ~]# docker version  
Client:  
Version:      18.09.0  
API version:  1.39  
Go version:   gol.10.4  
Git commit:   4d60db4  
Built:        Wed Nov  7 00:48:22 2018  
OS/Arch:      linux/amd64  
Experimental: false  
  
Server: Docker Engine - Community  
Engine:  
Version:      18.09.0  
API version:  1.39 (minimum version 1.12)  
Go version:   gol.10.4  
Git commit:   4d60db4  
Built:        Wed Nov  7 00:19:08 2018  
OS/Arch:      linux/amd64  
Experimental: false
```

### 2.3 ubuntu 安装（补充）

方法有很多，这里只说一种。

```
curl -sSL https://get.docker.com/ | sh  
systemctl start docker  
chkconfig docker on
```

## 第三章 harbor 安装

操作对象：

172.16.6.32

不是本文档的重点，这里不再想说，参考其他文档。

## 第四章 jenkins 环境准备

### 4.1 基础软件安装

操作对象：

10.1.5.64

需要准备 tomcat+jenkins+maven+jdk，搭建一个 jenkins 的环境，步骤比较简单，这里不再详细介绍。

### 4.2 ansible 安装

安装 ansible，方法很多，这里也不再详细介绍。

### 4.3 密钥认证

即是将 jenkins 本机的公钥发送到 172.16.6.33 机器，做免密认证，步骤很简单，这里不再详细介绍。

### 4.4 添加依赖

目标主机（172.16.6.33）需要安装 docker-py 模块，如果不安装，报错如下，将没法执行 ansible-docker 等模块。

```
*****
rue, "msg": "`docker-py` doesn't seem to be installed, but is required for the Ansible Docker module."}
te-jar-by-docker.retry
```

```
wget https://bootstrap.pypa.io/get-pip.py python get-pip.py
pip install docker-py
```

**ansible** 中和 **docker** 有关的模块如下：

```
docker_container
docker_image
docker_image_facts
docker_login
docker_network
docker_service
```

官方文档：

[https://docs.ansible.com/ansible/latest/modules/docker\\_image\\_module.html](https://docs.ansible.com/ansible/latest/modules/docker_image_module.html)

## 第五章 jenkins 配置

### 5.1 参数化构建

**工程 louxe-open-api-for-docker**

需要如下参数用于构建项目:

pname	<input type="text" value="louxe-open-api"/>
项目名, 作为变量使用	
version	<input type="text" value="0"/>
回滚的版本数, 当选择deploy时, 此参数无效	
action_choice	<input type="button" value="deploy"/>
选择动作:	
deploy : 部署	
rollback : 回滚	
env_choice	<input type="button" value="gray"/>
选择环境:	
gray : 灰度	
pro : 生产	
port	<input type="text" value="8081"/>

如上图, 为了适应通用性, 尽量多配置变量:

pname: 字符参数, 区分各个不同的项目, 这里使用打包出来的 jar 的名称进行区分

version: 字符参数, 选择版本, 用于回滚

action\_choice: 选项参数, 用于区分是部署还是回滚

env\_choice: 选项参数, 用于区分是灰度环境还是生产环境

port: 字符参数, 定义项目启用的端口

### 5.2 源码管理

Subversion

Modules

Repository URL	<input type="text" value="svn://120.24.96.74/tx2/open/branch/louxe-open-api-branch/louxe-open-api-P18"/>
Credentials	<input type="text" value="quzhongling/***** (svn_quzhongling)"/> <input type="button" value="Add"/>
Local module directory	<input type="text" value="."/>
Repository depth	<input type="button" value="infinity"/>
Ignore externals	<input checked="" type="checkbox"/>

如图，这里使用的是 svn 管理的，配置即可。

### 5.3 构建-打包和推送镜像

```
#打包
if [ $action_choice = "deplay" ];then
mvn clean package -Dmaven.test.skip=true -Puat

#准备 jar 文件及时区配置文件到 dockerfile 目录
[ ! -d /tmp/dockerfile ] && mkdir /tmp/dockerfile
rm -rf /tmp/dockerfile/*
cp $WORKSPACE/target/$pname.jar /tmp/dockerfile
cp /usr/share/zoneinfo/Asia/Shanghai /tmp/dockerfile

#准备 Dockerfile 文件
cat>/tmp/dockerfile/Dockerfile<<EOF
FROM frolvlad/alpine-oraclejdk8
MAINTAINER quzhongling quzhongling@lx2.com
VOLUME /data/lx2
COPY $pname.jar /$pname.jar
COPY Shanghai /etc/localtime
RUN mkdir -p /data/lx2 && echo 'Asia/Shanghai' > /etc/timezone
ENTRYPOINT ["java", "-jar", "/$pname.jar", "--server.port=$port"]
EOF

#生成镜像
cd /tmp/dockerfile
docker build -t $pname-oracle-jdk:v$BUILD_NUMBER .

#给镜像打标签
docker tag $pname-oracle-jdk:v$BUILD_NUMBER
172.16.6.32:5000/lx2/$pname-oracle-jdk:v$BUILD_NUMBER

#登陆私仓
docker login -u admin -p Harbor12345 172.16.6.32:5000

#推送到私仓
docker push 172.16.6.32:5000/lx2/$pname-oracle-jdk:v$BUILD_NUMBER

fi
```

```
执行 shell
命令 #打包
if [ $action_choice = "deploy" ];then
mvn clean package -Dmaven.test.skip=true -Putat

#准备jar文件及时区配置文件到dockerfile目录
[ ! -d /tmp/dockerfile ] && mkdir /tmp/dockerfile
rm -rf /tmp/dockerfile/*
cp $WORKSPACE/target/$pname.jar /tmp/dockerfile
cp /usr/share/zoneinfo/Asia/Shanghai /tmp/dockerfile

#准备Dockerfile文件
cat>/tmp/dockerfile/Dockerfile<<EOF
FROM frovlad/alpine-oraclejdk8
MAINTAINER quzhongling quzhongling@lx2.com
VOLUME /data/lx2
COPY $pname.jar /$pname.jar
COPY Shanghai /etc/localtime
RUN mkdir -p /data/lx2 && echo 'Asia/Shanghai' > /etc/timezone
ENTRYPOINT [ "java", "-jar", "/$pname.jar", "--server.port=$port" ]
EOF

#生成镜像
cd /tmp/dockerfile
docker build -t $pname-oracle-jdk:v$BUILD_NUMBER .

#给镜像打标签
docker tag $pname-oracle-jdk:v$BUILD_NUMBER 172.16.6.32:5000/lx2/$pname-oracle-jdk:v$BUILD_NUMBER

#登陆私仓
docker login -u admin -p Harbor12345 172.16.6.32:5000

#推送到私仓
docker push 172.16.6.32:5000/lx2/$pname-oracle-jdk:v$BUILD_NUMBER

fi
```

## 5.4 构建-部署和回滚

```
cd ~/playbook-pro-by-quzl

if [ $action_choice = "deploy" ];then
    ansible-playbook -i hosts update-jar-by-docker.yml -e "port=$port
pname=$pname version=$BUILD_NUMBER action_choice=$action_choice"
else
    ansible-playbook -i hosts update-jar-by-docker.yml -e "port=$port
pname=$pname version=$version action_choice=$action_choice"
fi
```

```
执行 shell
命令 cd ~/playbook-pro-by-quzl
if [ $action_choice = "deploy" ];then
    ansible-playbook -i hosts update-jar-by-docker.yml -e "port=$port pname=$pname version=$BUILD_NUMBER action_choice
else
    ansible-playbook -i hosts update-jar-by-docker.yml -e "port=$port pname=$pname version=$version action_choice=$ac
fi
查看 可用的环境变量列表
```

## 5.5 补充 ansible 脚本

```
cat update-jar-by-docker.yml
```



```

- hosts: louxe-open-api-by-docker
  gather_facts: false #不采集系统信息，有利于加速访问
  remote_user: root
  serial: 1 #串行执行
  tasks:
    - name: 登陆私仓
      docker_login:
        registry: 172.16.6.32:5000
        username: admin
        password: Harbor12345
        reauthorize: no

    - name: 拉取镜像
      docker_image:
        name: 172.16.6.32:5000/lx2/{{ pname }}-oracle-jdk
        tag: v{{ version }}
        pull: yes

    - name: 停止当前运行的容器
      shell: docker stop $(docker ps|grep louxe-open-api|awk '{print $NF}')
      ignore_errors: yes

    - name: 删除旧容器，保留最近的 30 个
      shell: docker rm $(docker ps -a -f name={{ pname }} -q|tail -n +30)
      ignore_errors: yes

    - name: 删除旧的镜像，保留最近的 30 个
      shell: docker rmi $(docker images
172.16.6.32:5000/lx2/{{pname}}-oracle-jdk -q|tail -n +31)
      ignore_errors: yes

    - name: 启动新容器-版本是-{{version}}
      docker_container:
        name: "{{ pname }}-v{{ version }}"
        image: 172.16.6.32:5000/lx2/{{ pname }}-oracle-
jdk:v{{ version }}
        state: started
        volumes:
          - /data/lx2:/data/lx2
        ports:
          - "{{ port }}:{{ port }}"
...

```

对应的 host 文件包含如下内容：

```
root@jenkins:~/playbook-pro-by-quzl# grep docker -A1 hosts
##### docker test #####
[louxe-open-api-by-docker]
172.16.6.33
##### docker test #####
```

## 第六章 验证

### 6.1 部署

```
Started by user jenkins系统管理员
Building in workspace /root/.jenkins/workspace/louxe-open-api-for-docker
Updating svn://120.24.96.74/lx2/open/branch/louxe-open-api-branch/louxe-open-api-P18 at revision '2018-11-23T15:24:33.808 +0800'
At revision 153

No changes for svn://120.24.96.74/lx2/open/branch/louxe-open-api-branch/louxe-open-api-P18 since the previous build
[louxe-open-api-for-docker] $ /bin/sh -xe /data/tomcat-jenkins-prd-8080/temp/jenkins2972227035154900508.sh
+ [ deploy = deploy ]
+ mvn clean package -Dmaven.test.skip=true -Puat
[INFO] Scanning for projects...
```

部署 deploy, 拉取代码,

```
[INFO]
[INFO] --- spring-boot-maven-plugin:1.5.10.RELEASE:repackage (default) @ louxe-
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 17.523 s
[INFO] Finished at: 2018-11-23T15:24:54+08:00
[INFO] Final Memory: 51M/589M
[INFO]
```

maven 构建成功

```
[INFO]
+ [ ! -d /tmp/dockerfile ]
+ rm -rf /tmp/dockerfile/Dockerfile /tmp/dockerfile/Shanghai /tmp/dockerfile/louxe-open-api.jar
+ cp /root/.jenkins/workspace/louxe-open-api-for-docker/target/louxe-open-api.jar /tmp/dockerfile
+ cp /usr/share/zoneinfo/Asia/Shanghai /tmp/dockerfile
+ cat
+ cd /tmp/dockerfile
+ docker build -t louxe-open-api-oracle-jdk:v65 .
Sending build context to Docker daemon 64.02MB

Step 1/7 : FROM frodo/alpine-oraclejdk8
--> b81355b10fa3
Step 2/7 : MAINTAINER quzhongling quzhongling@lx2.com
--> Using cache
--> 59d1243ab9c9
Step 3/7 : VOLUME /data/lx2
--> Using cache
--> 26a987e88898
Step 4/7 : COPY louxe-open-api.jar /louxe-open-api.jar
--> 96bf695c545d
Step 5/7 : COPY Shanghai /etc/localtime
--> d7b2c8c4cf54
Step 6/7 : RUN mkdir -p /data/lx2 && echo 'Asia/Shanghai' > /etc/timezone
--> Running in 7c8ea523f3a2
Removing intermediate container 7c8ea523f3a2
--> 44edf9551a0d
Step 7/7 : ENTRYPOINT ["java", "-jar", "/louxe-open-api.jar", "--server.port=8081"]
--> Running in 45e794c8f265
Removing intermediate container 45e794c8f265
--> 46d104218ecc
Successfully built 46d104218ecc
Successfully tagged louxe-open-api-oracle-jdk:v65
+ docker tag louxe-open-api-oracle-jdk:v65 172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v65
```

生成镜像, 并推送到镜像仓库

```

v65: digest: sha256:ee6a06340bf79a9b2fde4d411c9361412e0ac373c65961e118e609003b70f983 size: 1577
[louxe-open-api-for-docker] $ /bin/sh -xe /data/tomcat-jenkins-prd-6080/temp/jenkins5245370163964628770.sh
+ cd /root/playbook-pro-by-quzl
+ [ deploy = deploy ]
+ ansible-playbook -i hosts update-jar-by-docker.yml -e port=8081 pname=louxe-open-api version=65 action_choice=deploy
[WARNING]: Found variable using reserved name: port

PLAY [louxe-open-api-by-docker] *****

TASK [登陆私仓] *****
ok: [172.16.6.33]

TASK [拉取镜像] *****
changed: [172.16.6.33]

TASK [停止当前运行的容器] *****
changed: [172.16.6.33]

TASK [删除旧容器，保留最近的30个] *****
fatal: [172.16.6.33]: FAILED! => {"changed": true, "cmd": "docker rm $(docker ps -a -f name='louxe-open-api -q|tail -n +30)", "delta": "0:00:00.144304", "end": "2018-11-23 15:26:19.680412", "failed": true, "rc": 1, "start": "2018-11-23 15:26:18.939424", "stderr": "\ndocker rm\nrequires at least 1 argument.\n\nUsage: docker rm [OPTIONS] CONTAINER [CONTAINER...]\n\nRemove one or more containers", "stderr_lines": ["\ndocker rm\nrequires at least 1 argument.", "\n\nUsage: docker rm [OPTIONS] CONTAINER [CONTAINER...]", "\n\nRemove one or more containers"], "stdout": "...ignoring"}

TASK [删除旧的镜像，保留最近的30个] *****
fatal: [172.16.6.33]: FAILED! => {"changed": true, "cmd": "docker rmi $(docker images 172.16.6.32:5000/lx2/louxe-open-api-oracle\n11-23 15:26:19.082249", "delta": "0:00:00.144304", "end": "2018-11-23 15:26:19.680412", "failed": true, "rc": 1, "start": "2018-11-23 15:26:19.536108", "stderr": "\ndocker rmi\nrequires at least 1 argument.\n\nUsage: docker rmi [OPTIONS] IMAGE [IMAGE...]\n\nRemove one or more images", "stderr_lines": ["\ndocker rmi\nrequires at least 1 argument.", "\n\nUsage: docker rmi [OPTIONS] IMAGE [IMAGE...]", "\n\nRemove one or more images"], "stdout": "...ignoring"}

TASK [启动新容器-版本是65] *****
changed: [172.16.6.33]

PLAY RECAP *****
172.16.6.33 : ok=6 changed=5 unreachable=0 failed=0

```

拉取镜像并部署

## 6.2 回滚

```

Started by user jenkins系统管理员
Building in workspace /root/.jenkins/workspace/louxe-open-api-for-docker
Updating svn://120.24.96.74/lx2/open/branch/louxe-open-api-branch/louxe-open-api-P18 at revision '2018-11-23T15:33:07.764 +0800'
At revision 153

No changes for svn://120.24.96.74/lx2/open/branch/louxe-open-api-branch/louxe-open-api-P18 since the previous build
[louxe-open-api-for-docker] $ /bin/sh -xe /data/tomcat-jenkins-prd-6080/temp/jenkins3790457368197757490.sh
+ [ rollback = deploy ]
[louxe-open-api-for-docker] $ /bin/sh -xe /data/tomcat-jenkins-prd-6080/temp/jenkins3150239448498531080.sh
+ cd /root/playbook-pro-by-quzl
+ [ rollback = deploy ]
+ ansible-playbook -i hosts update-jar-by-docker.yml -e port=8081 pname=louxe-open-api version=59 action_choice=rollback
[WARNING]: Found variable using reserved name: port
PLAY [louxe-open-api-by-docker] *****

TASK [登陆私仓] *****
ok: [172.16.6.33]

TASK [拉取镜像] *****
ok: [172.16.6.33]

TASK [停止当前运行的容器] *****
changed: [172.16.6.33]

TASK [删除旧容器，保留最近的30个] *****
fatal: [172.16.6.33]: FAILED! => {"changed": true, "cmd": "docker rm $(docker ps -a -f name='louxe-open-api -q|tail -n +30)", "delta": "0:00:00.144304", "end": "2018-11-23 15:34:14.739809", "failed": true, "rc": 1, "start": "2018-11-23 15:34:14.739809", "stderr": "\ndocker rm\nrequires at least 1 argument.\n\nUsage: docker rm [OPTIONS] CONTAINER [CONTAINER...]\n\nRemove one or more containers", "stderr_lines": ["\ndocker rm\nrequires at least 1 argument.", "\n\nUsage: docker rm [OPTIONS] CONTAINER [CONTAINER...]", "\n\nRemove one or more containers"], "stdout": "...ignoring"}

```

直接启动本地已有的容器，版本是 59

## 6.3 程序宿主机观察

```
[root@docker03 louxe-open-api]# docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v65	46d184218ecc	11 minutes ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v59	03f175765c33	5 hours ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v54	00b7659f6d36	2 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v52	942c86c9d4f9	4 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v51	1e1177b3857	4 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v50	bcd384a523b	4 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v49	a445bc1205c1	4 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v46	71a78d8ad63	4 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v45	0d8d07f2c14c	4 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v44	b8b30d0dda0	7 days ago	232MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v42	8c2db4d55dda	7 days ago	231MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v41	7779eed6ded9c	7 days ago	231MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v40	633d10876d80	7 days ago	231MB
172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk	v39	441a81277b6d	7 days ago	231MB

```
[root@docker03 louxe-open-api]# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c03a5899cf7	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v65	"java -jar /louxe-op..."	10 minutes ago	Exited (143) 2 minutes ago		louxe-open-api-v65
fa0d43857dad	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v59	"java -jar /louxe-op..."	5 hours ago	Up 2 minutes	0.0.0.0:8081->8081/tcp	louxe-open-api-v59
3e0ed8675ec9c	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v54	"java -jar /louxe-op..."	2 days ago	Exited (143) 5 hours ago		louxe-open-api-v54
12ece0aa0212	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v51	"java -jar /louxe-op..."	4 days ago	Exited (143) 2 days ago		louxe-open-api-v51
57f5dc704bf2	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v52	"java -jar /louxe-op..."	4 days ago	Exited (143) 4 days ago		louxe-open-api-v52
764c1db0c5d8	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v49	"java -jar /louxe-op..."	4 days ago	Exited (143) 4 days ago		louxe-open-api-v49
2a1525ae76dc	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v50	"java -jar /louxe-op..."	4 days ago	Exited (143) 4 days ago		louxe-open-api-v50
614e4b3e4370	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v46	"java -jar /louxe-op..."	4 days ago	Exited (143) 4 hours ago		louxe-open-api-v46
9081cb1340a	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v45	"java -jar /louxe-op..."	4 days ago	Exited (143) 4 days ago		louxe-open-api-v45
2a189a9edc5	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v44	"java -jar /louxe-op..."	7 days ago	Exited (143) 4 days ago		louxe-open-api-v44
46afcb08908	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v42	"java -jar /louxe-op..."	7 days ago	Exited (143) 7 days ago		louxe-open-api-v42
17f71025659d	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v41	"java -jar /louxe-op..."	7 days ago	Exited (143) 7 days ago		louxe-open-api-v41
c35ca06855ef	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v40	"java -jar /louxe-op..."	7 days ago	Exited (143) 7 days ago		louxe-open-api-v40
0473ae293f05	172.16.6.32:5000/lx2/louxe-open-api-oracle-jdk:v39	"java -jar /louxe-op..."	7 days ago	Exited (143) 7 days ago		louxe-open-api-v39

```
[root@docker03 louxe-open-api]#
```

启动容器时，要按照规律进行命名，这样便于回滚。ansible-playbook 脚本配置保留最近的 30 个镜像、最近 30 个容器，用于回滚。如果更早的版本，会自动到镜像仓库拉取并重新生成容器。

## 6.4 私仓观察

< 项目 < 镜像仓库

lx2/louxe-open-api-oracle-jdk

描述信息 镜像

扫描 复制摘要 添加标签 删除

<input type="checkbox"/>	标签	大小	Pull命令	作者	创建时间	Docker 版本	标签
<input type="checkbox"/>	v65	114.93MB		quzhongling quzhongling@lx2.com	2018/11/23 下午3:24	18.06.1-ce	
<input type="checkbox"/>	v59	114.92MB		quzhongling quzhongling@lx2.com	2018/11/23 上午10:32	18.06.1-ce	
<input type="checkbox"/>	v54	114.92MB		quzhongling quzhongling@lx2.com	2018/11/20 下午5:56	18.06.1-ce	
<input type="checkbox"/>	v52	114.92MB		quzhongling quzhongling@lx2.com	2018/11/19 下午3:23	18.06.1-ce	
<input type="checkbox"/>	v51	114.92MB		quzhongling quzhongling@lx2.com	2018/11/19 下午2:59	18.06.1-ce	
<input type="checkbox"/>	v50	114.92MB		quzhongling quzhongling@lx2.com	2018/11/19 下午2:58	18.06.1-ce	

只要磁盘空间够用，可保留很多镜像文件。

至此，结束！