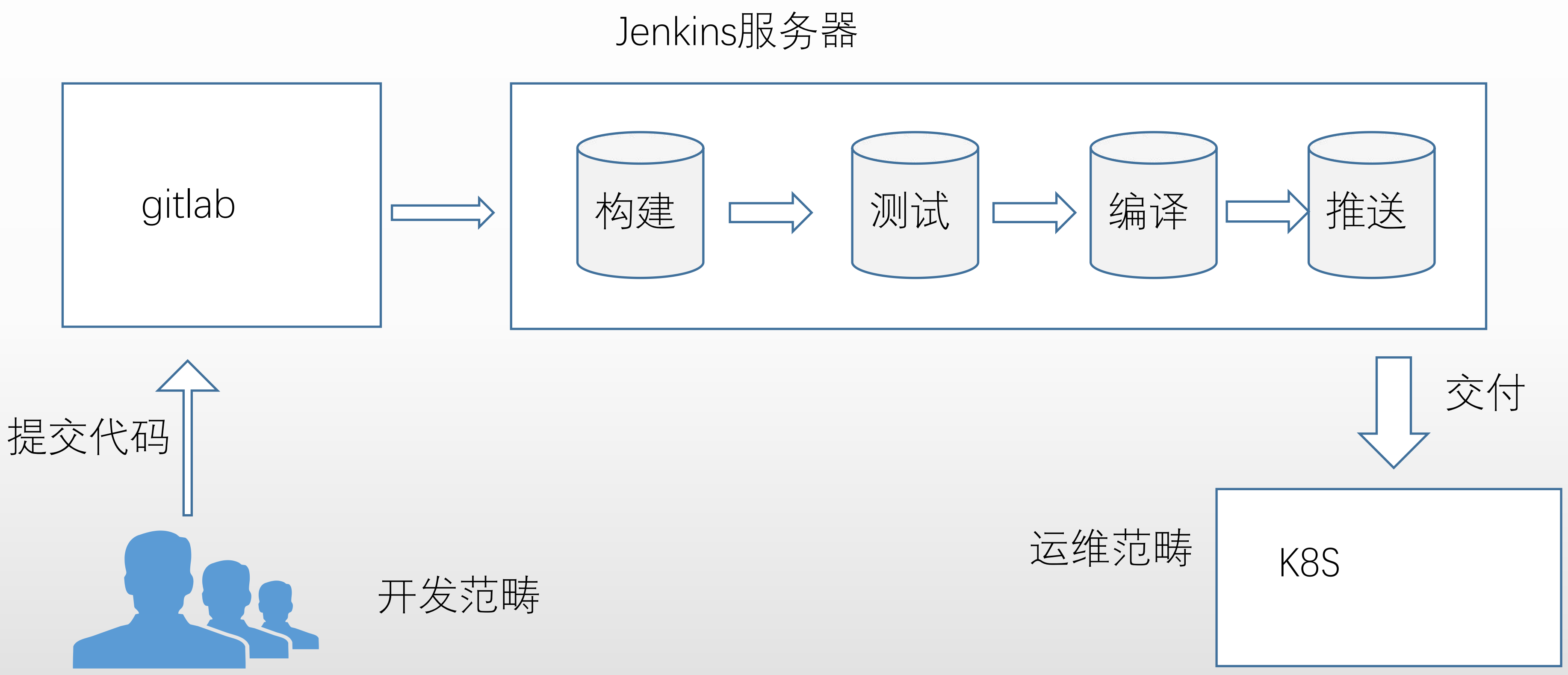
CKA-15CI/CD/devops

讲师： 老段 RHCE/RHCA/COA/CKA

devops的意义

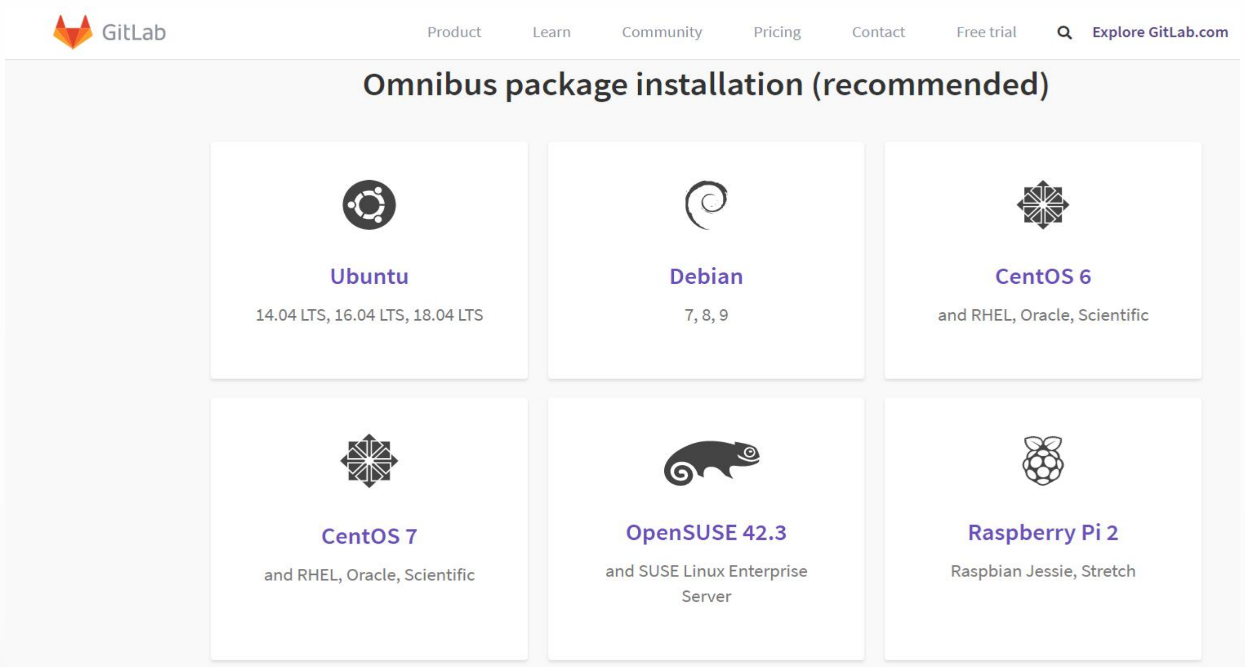
- 介绍devops
- 什么是可持续集成CI
- 什么是可持续交付CD
- 什么是可持续部署CD

使用gitlab+Jenkins+k8s建立CI/CD解决方案



gitlab安装

https://about.gitlab.com/installation/
下载地址
https://packages.gitlab.com/gitlab/gitlab-ce/



Omnibus package installation (recommended)

Ubuntu
14.04 LTS, 16.04 LTS, 18.04 LTS

Debian
7, 8, 9

CentOS 6
and RHEL, Oracle, Scientific

CentOS 7
and RHEL, Oracle, Scientific

OpenSUSE 42.3
and SUSE Linux Enterprise Server

Raspberry Pi 2
Raspbian Jessie, Stretch

配置yum源

```
curl https://packages.gitlab.com/install/repositories/gitlab/gitlab-ce/script.rpm.sh | sudo bash
```

安装

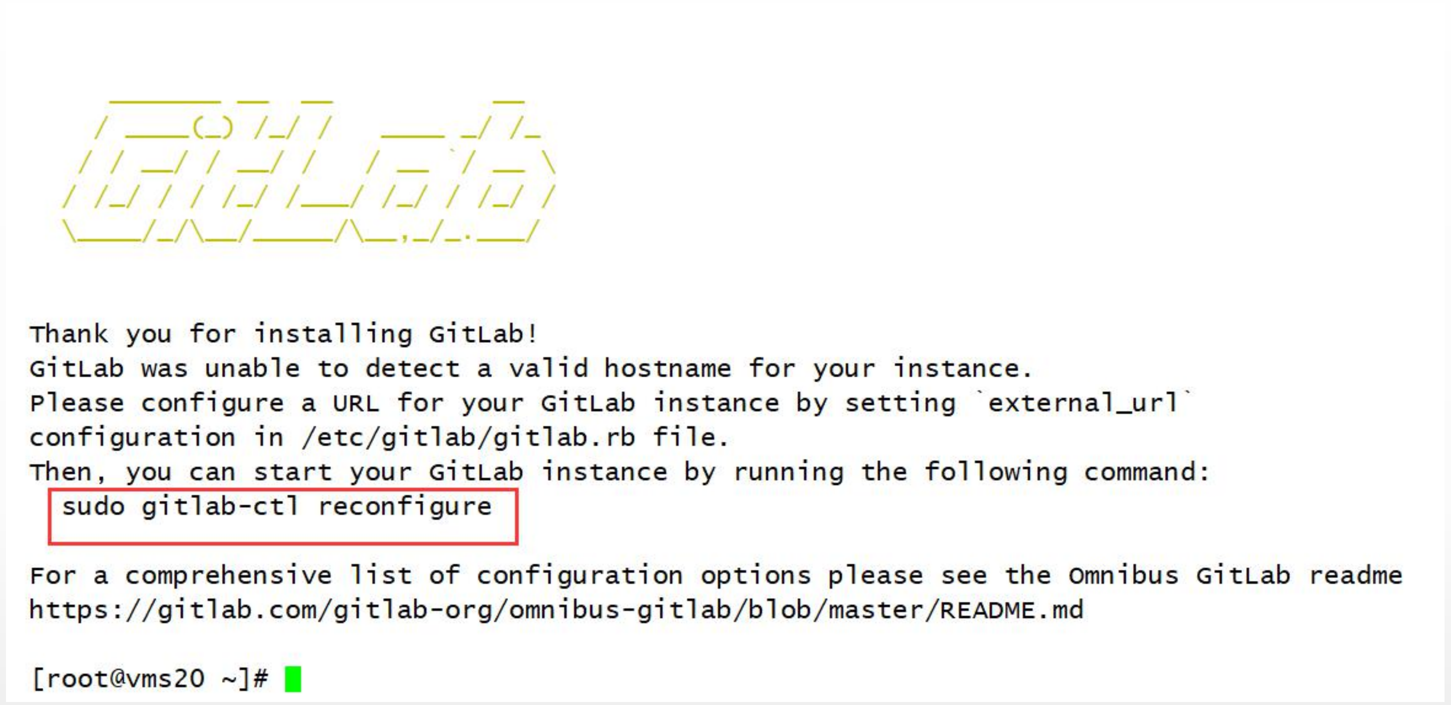
```
yum install gitlab-ce-11.6.2-ce.0.el7.x86_64
```

练习用离线包

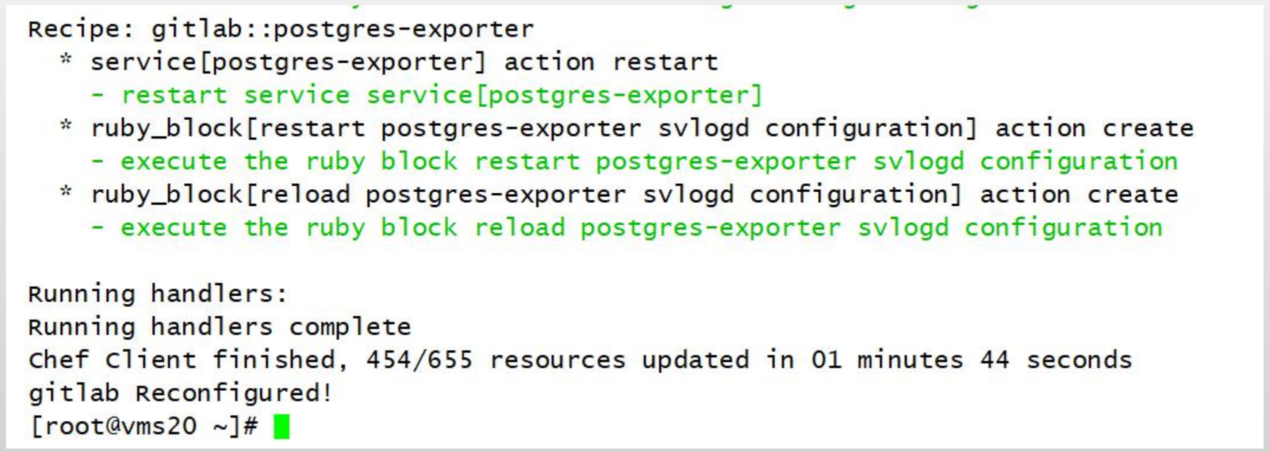
vim /etc/gitlab/gitlab.rb
13 external_url 'http://192.168.26.20'

gitlab-ctl reconfigure

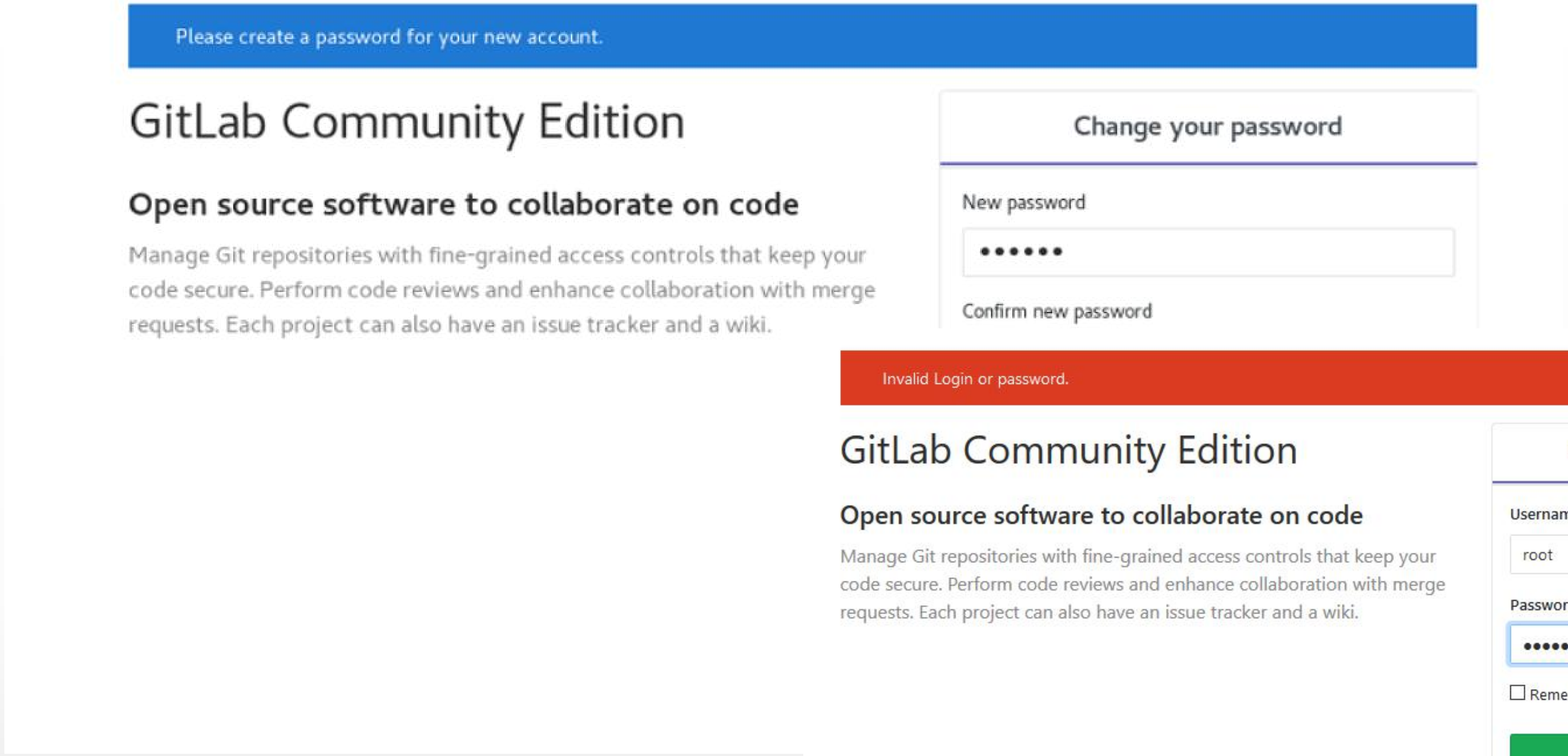
(gitlab-ctl restart或reboot）



```
Thank you for installing GitLab!
GitLab was unable to detect a valid hostname for your instance.
Please configure a URL for your GitLab instance by setting `external_url`
configuration in /etc/gitlab/gitlab.rb file.
Then, you can start your GitLab instance by running the following command:
  sudo gitlab-ctl reconfigure

For a comprehensive list of configuration options please see the Omnibus GitLab readme
https://gitlab.com/gitlab-org/omnibus-gitlab/blob/master/README.md

[root@vms20 ~]#
```



```
Recipe: gitlab::postgres-exporter
  * service[postgres-exporter] action restart
    - restart service service[postgres-exporter]
  * ruby_block[restart postgres-exporter svlogd configuration] action create
    - execute the ruby block restart postgres-exporter svlogd configuration
  * ruby_block[reload postgres-exporter svlogd configuration] action create
    - execute the ruby block reload postgres-exporter svlogd configuration

Running handlers:
Running handlers complete
Chef Client finished, 454/655 resources updated in 01 minutes 44 seconds
gitlab Reconfigured!
[root@vms20 ~]#
```



Please create a password for your new account.

GitLab Community Edition

Open source software to collaborate on code

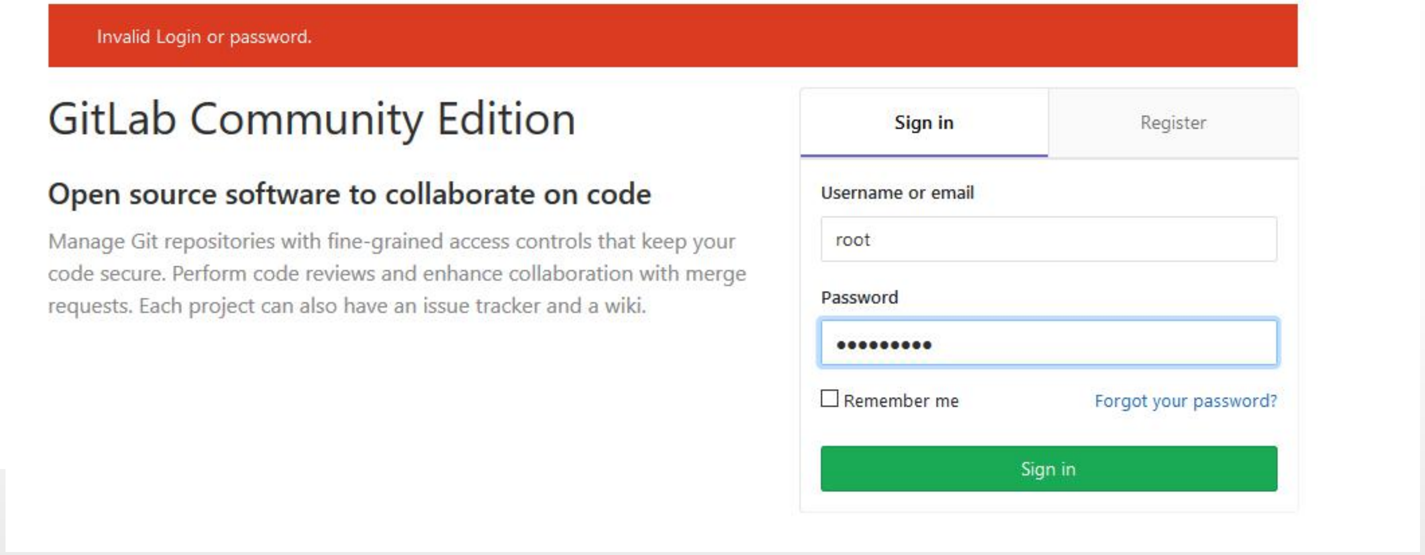
Manage Git repositories with fine-grained access controls that keep your code secure. Perform code reviews and enhance collaboration with merge requests. Each project can also have an issue tracker and a wiki.

Change your password

New password

••••••

Confirm new password



Invalid Login or password.

GitLab Community Edition

Open source software to collaborate on code

Manage Git repositories with fine-grained access controls that keep your code secure. Perform code reviews and enhance collaboration with merge requests. Each project can also have an issue tracker and a wiki.

Username or email

root

Password

•••••••••

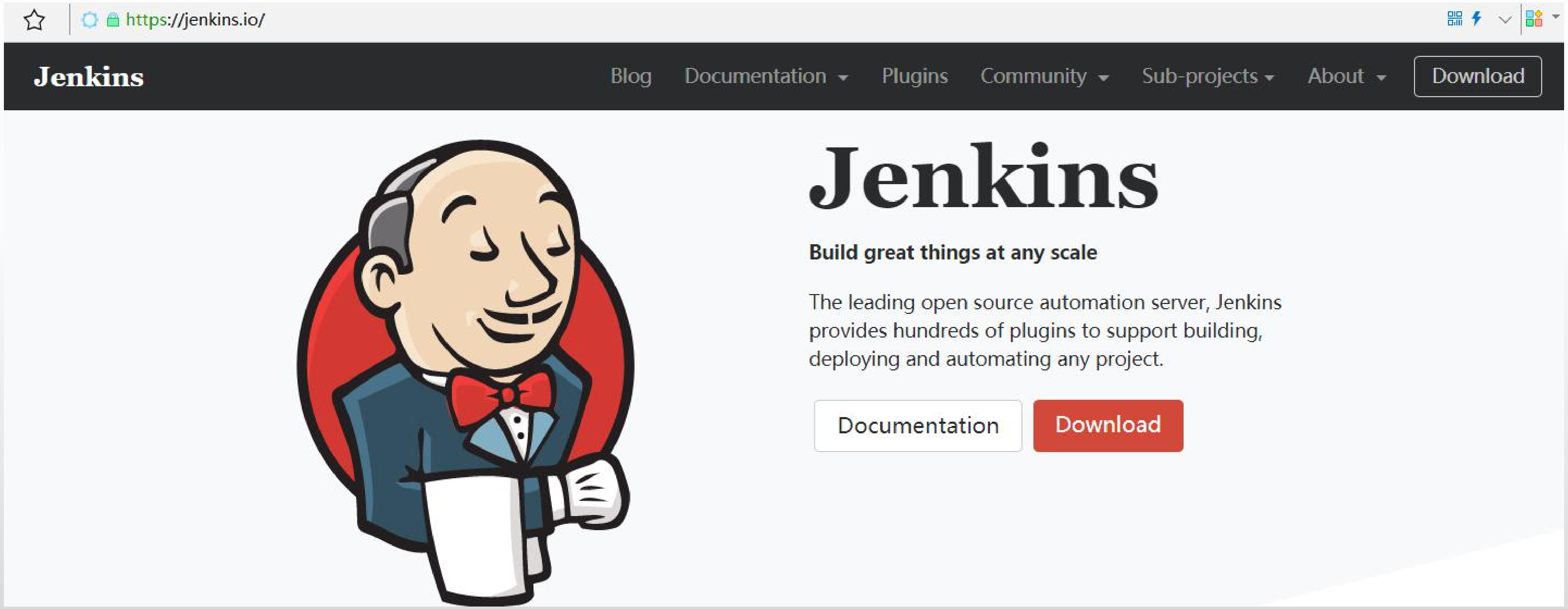
gitlab的操作

- web界面的操作

git命令的使用

- git clone http://osp60.rhce.cc/root/dockerimage.git
- git clone http://osp60.rhce.cc/root/dockerimage.git /xxx
- git add .
- git commit 'xx'
- git push

安装Jenkins



Jenkins

Build great things at any scale

The leading open source automation server, Jenkins provides hundreds of plugins to support building, deploying and automating any project.

安装步骤

```
wget -O /etc/yum.repos.d/jenkins.repo
https://pkg.jenkins.io/redhat/jenkins.repo
```

```
rpm --import https://pkg.jenkins.io/redhat/jenkins.io.key
```

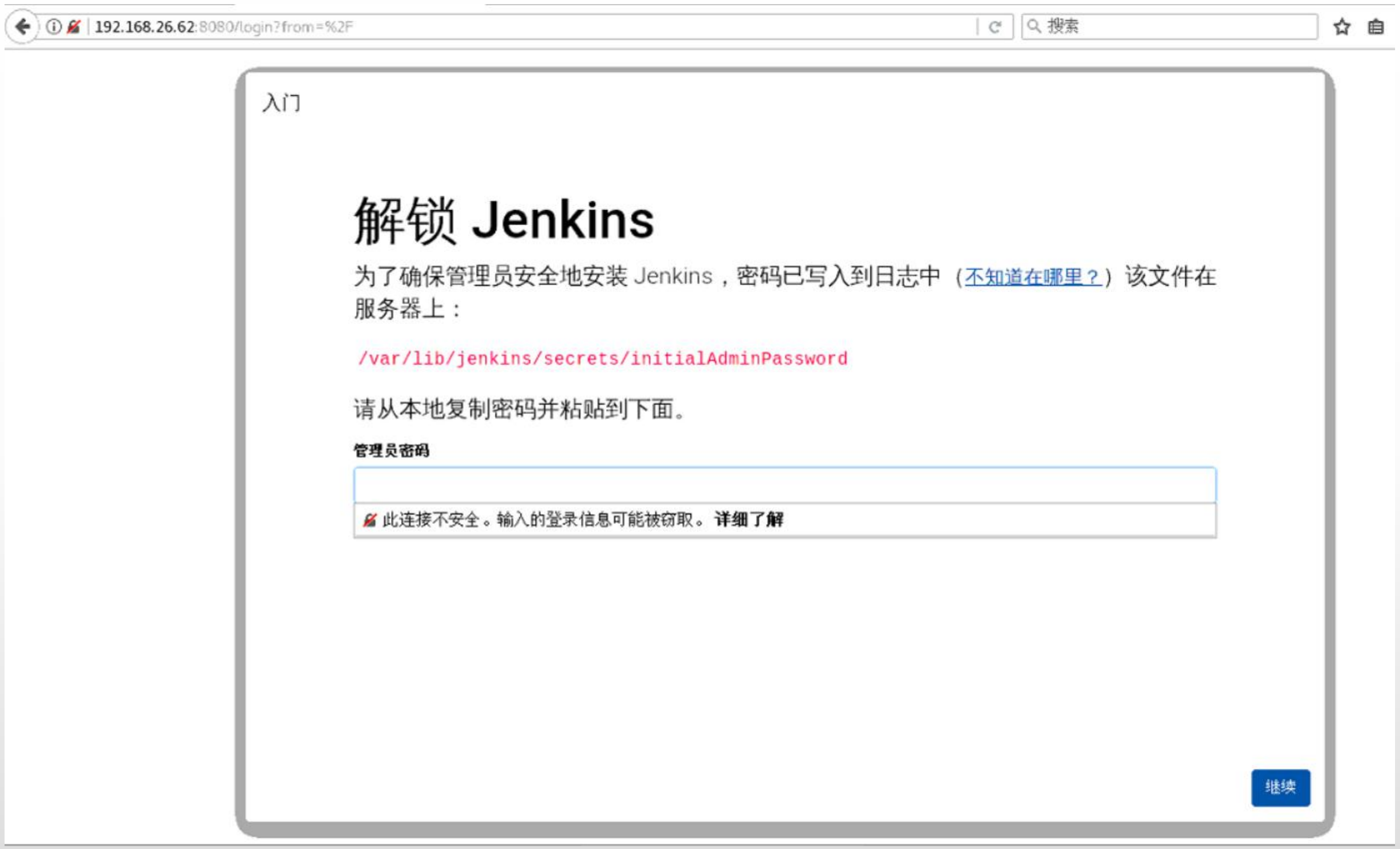
```
yum install jenkins
```

安装jdk

http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html

```
/etc/init.d/jenkins start
```

```
netstat -ntulp | grep 8080
```



192.168.26.62:8080/login?from=%2F

入门

解锁 Jenkins

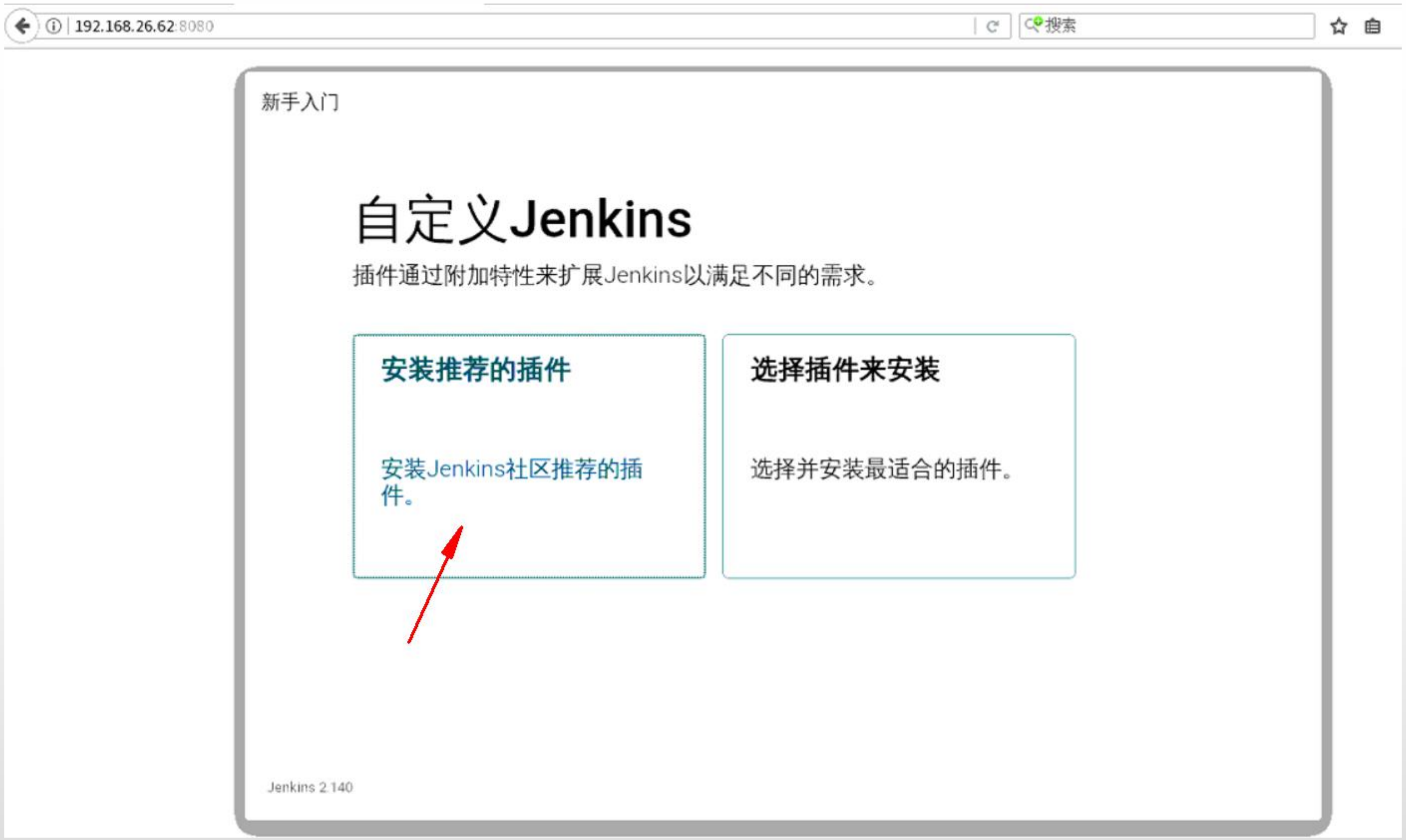
为了确保管理员安全地安装 Jenkins，密码已写入到日志中（不知道在哪里？）该文件在服务器上：

```
/var/lib/jenkins/secrets/initialAdminPassword
```

请从本地复制密码并粘贴到下面。

管理员密码

此连接不安全。输入的登录信息可能被窃取。 **详细了解**


192.168.26.62:8080

新手入门

自定义Jenkins

插件通过附加特性来扩展Jenkins以满足不同的需求。

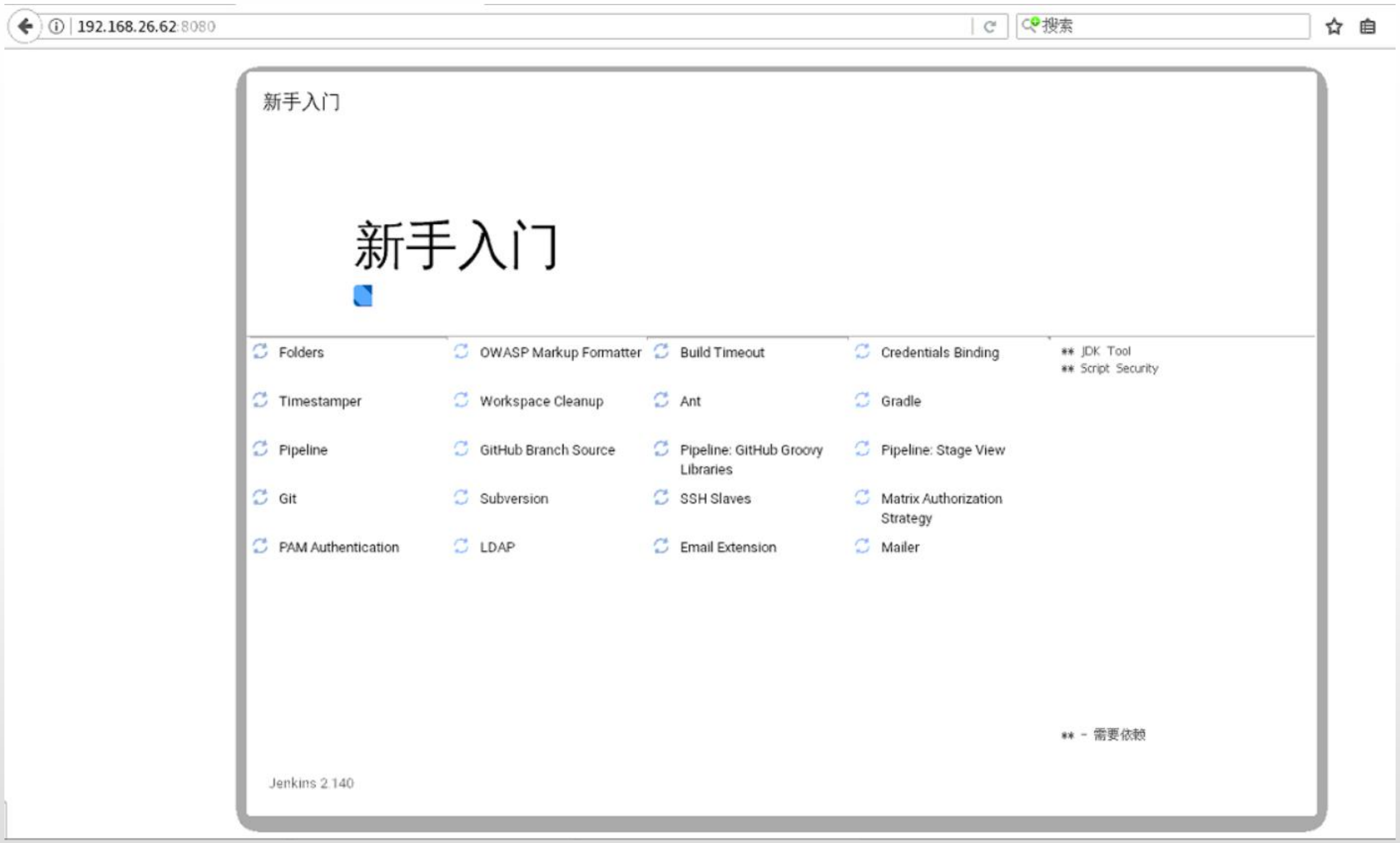
安装推荐的插件

安装Jenkins社区推荐的插件。

选择插件来安装

选择并安装最适合的插件。

Jenkins 2.140


192.168.26.62:8080

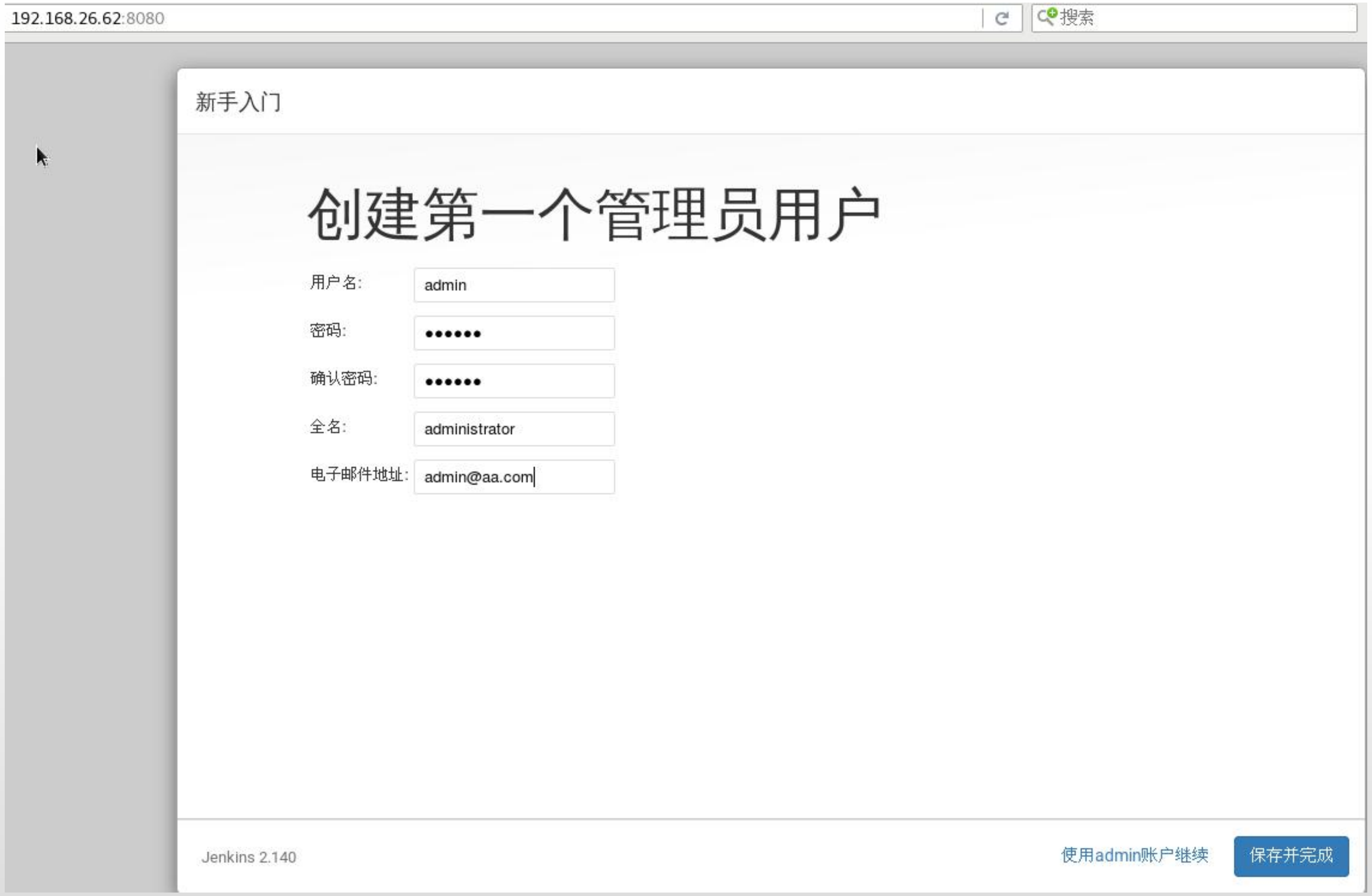
新手入门

新手入门

Folders	OWASP Markup Formatter	Build Timeout	Credentials Binding	** JDK Tool ** Script Security
Timestamper	Workspace Cleanup	Ant	Gradle	
Pipeline	GitHub Branch Source	Pipeline: GitHub Groovy Libraries	Pipeline: Stage View	
Git	Subversion	SSH Slaves	Matrix Authorization Strategy	
PAM Authentication	LDAP	Email Extension	Mailer	

** - 需要依赖

Jenkins 2.140


192.168.26.62:8080

搜索

新手入门

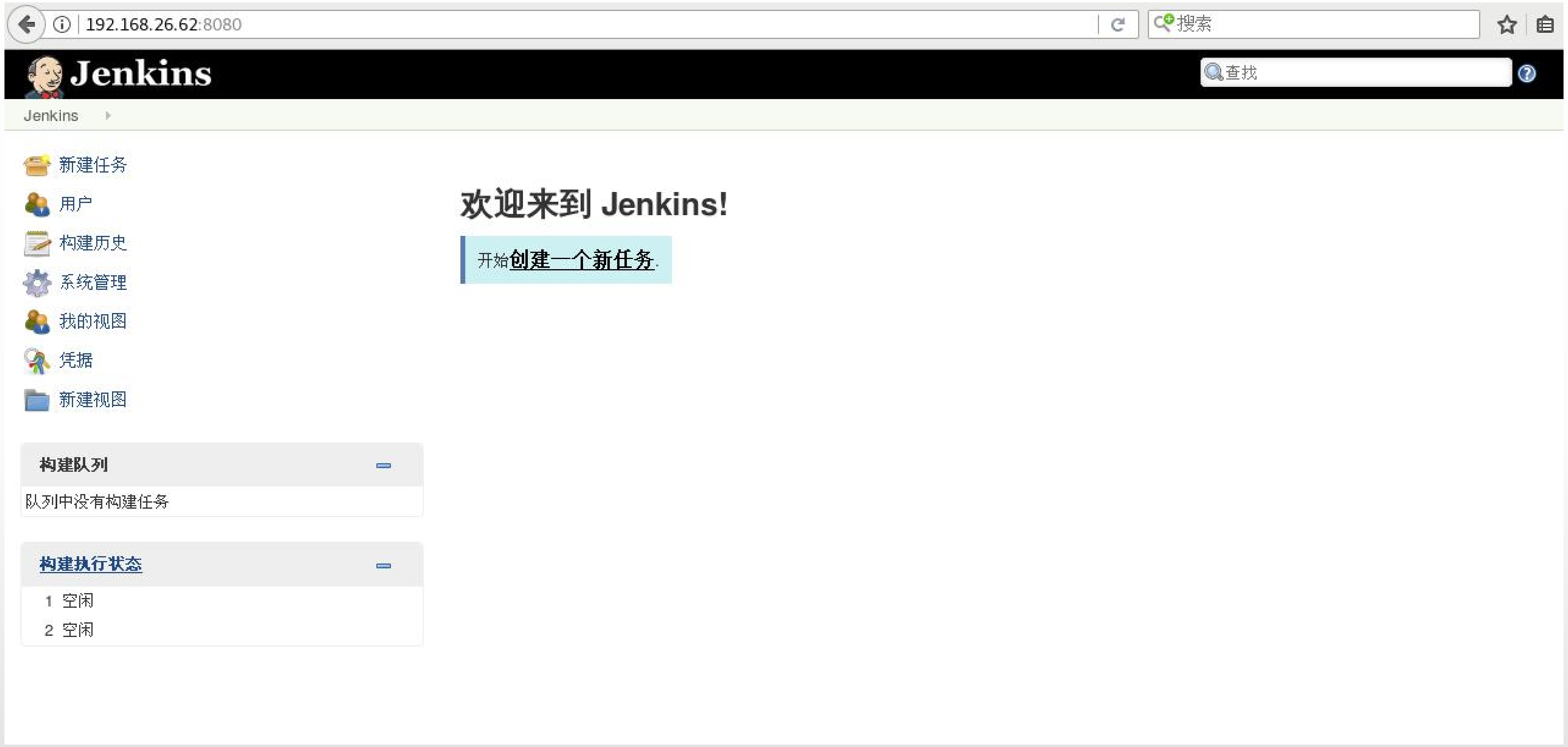
创建第一个管理员用户

用户名:	admin
密码:	••••••
确认密码:	••••••
全名:	administrator
电子邮件地址:	admin@aa.com

Jenkins 2.140

使用admin账户继续

保存并完成



欢迎来到 Jenkins!

开始**创建一个新任务**.

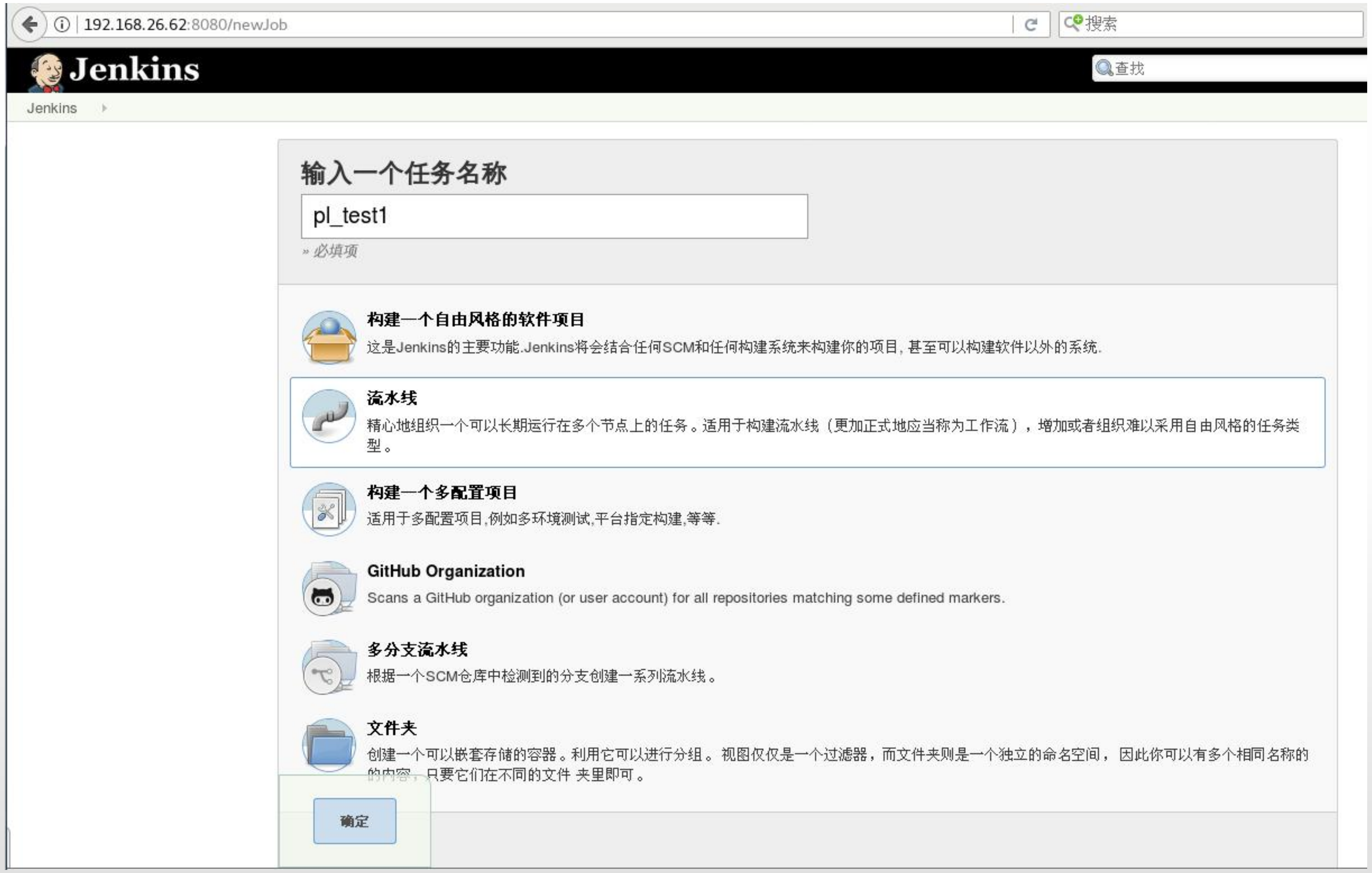
构建队列

队列中没有构建任务

构建执行状态

1 空闲

2 空闲


192.168.26.62:8080/newJob

Jenkins

输入一个任务名称

pl_test1

» 必填项

构建一个自由风格的软件项目
这是Jenkins的主要功能.Jenkins将会结合任何SCM和任何构建系统来构建你的项目, 甚至可以构建软件以外的系统.

流水线
精心地组织一个可以长期运行在多个节点上的任务。适用于构建流水线（更加正式地应当称为工作流），增加或者组织难以采用自由风格的任务类型。

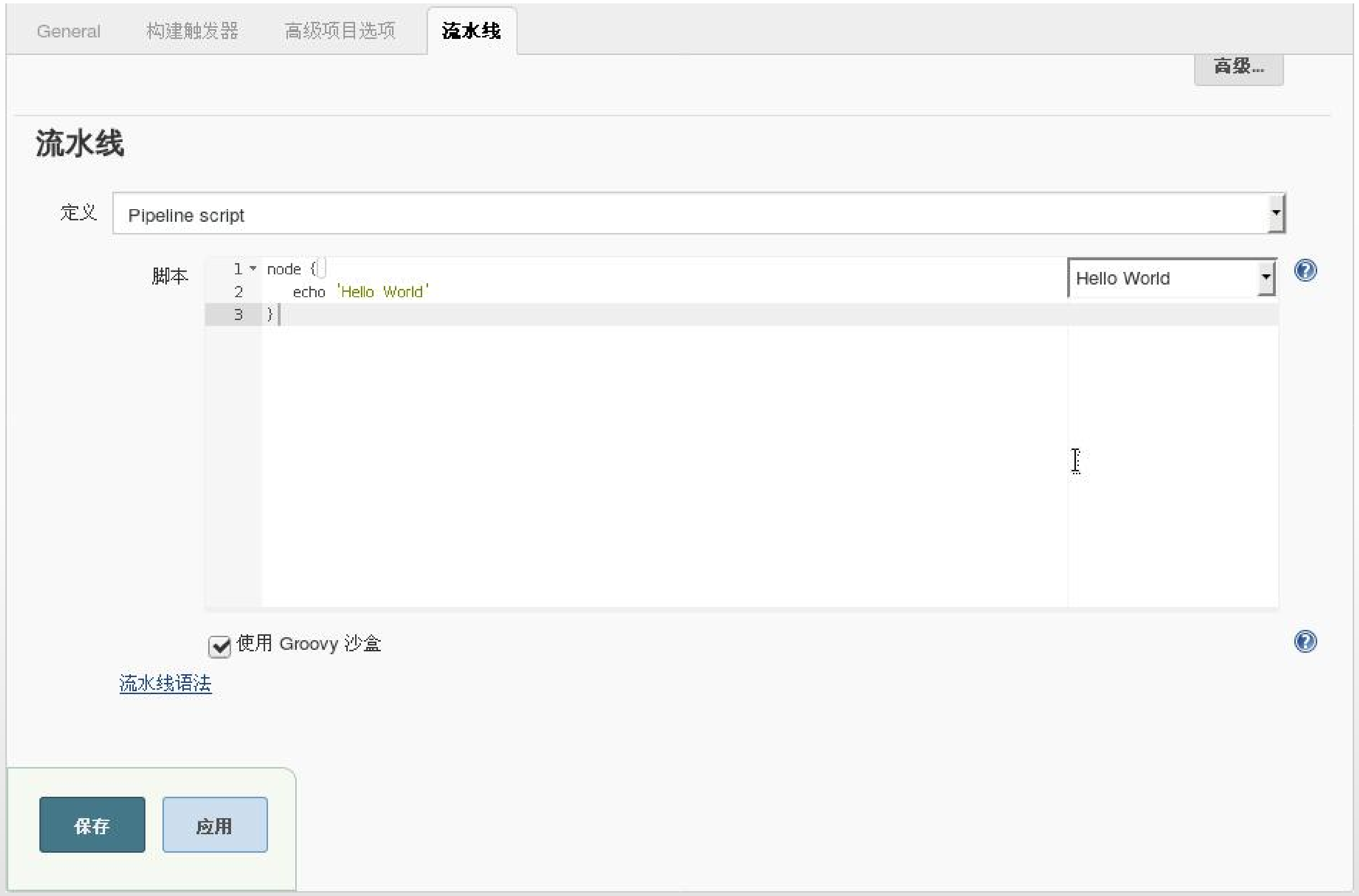
构建一个多配置项目
适用于多配置项目,例如多环境测试,平台指定构建,等等.

GitHub Organization
Scans a GitHub organization (or user account) for all repositories matching some defined markers.

多分支流水线
根据一个SCM仓库中检测到的分支创建一系列流水线。

文件夹
创建一个可以嵌套存储的容器。利用它可以进行分组。 视图仅仅是一个过滤器，而文件夹则是一个独立的命名空间， 因此你可以有多个相同名称的的内容，只要它们在不同的文件 夹里即可。

确定



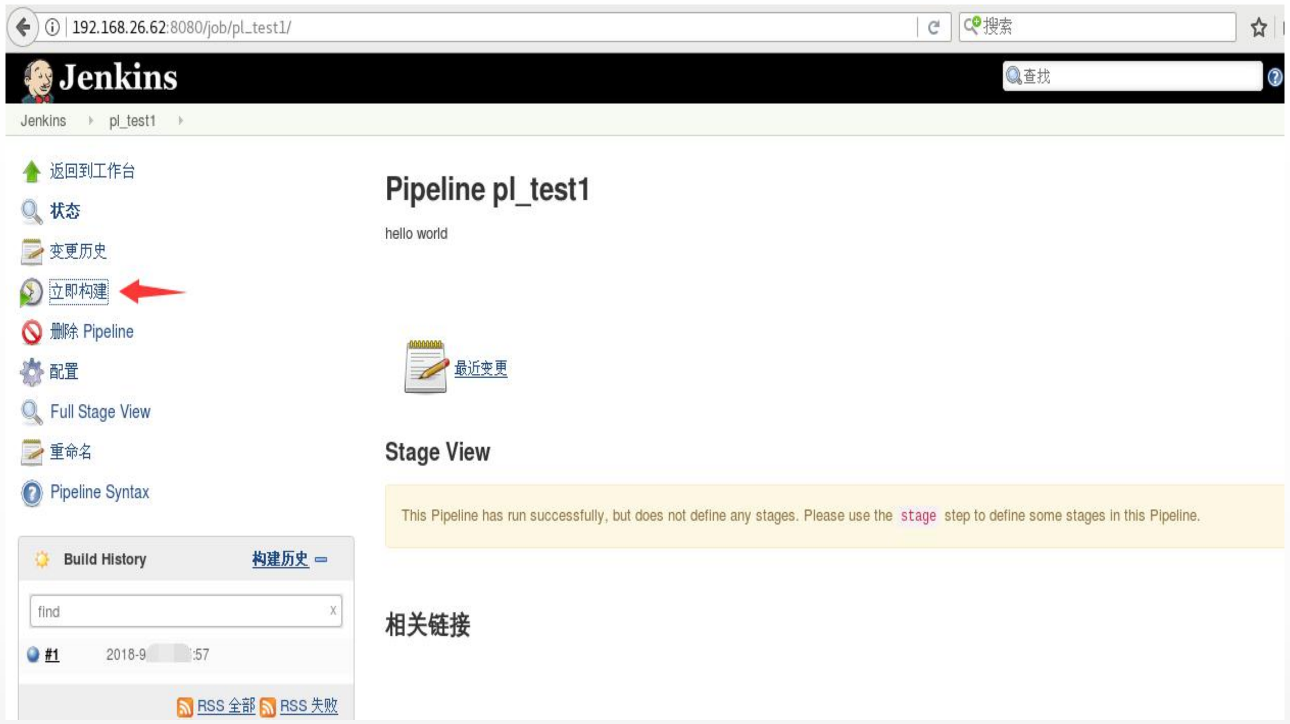
流水线

定义: Pipeline script

脚本

```
node {
  echo 'Hello World'
}
```

[✓] 使用 Groovy 沙盒



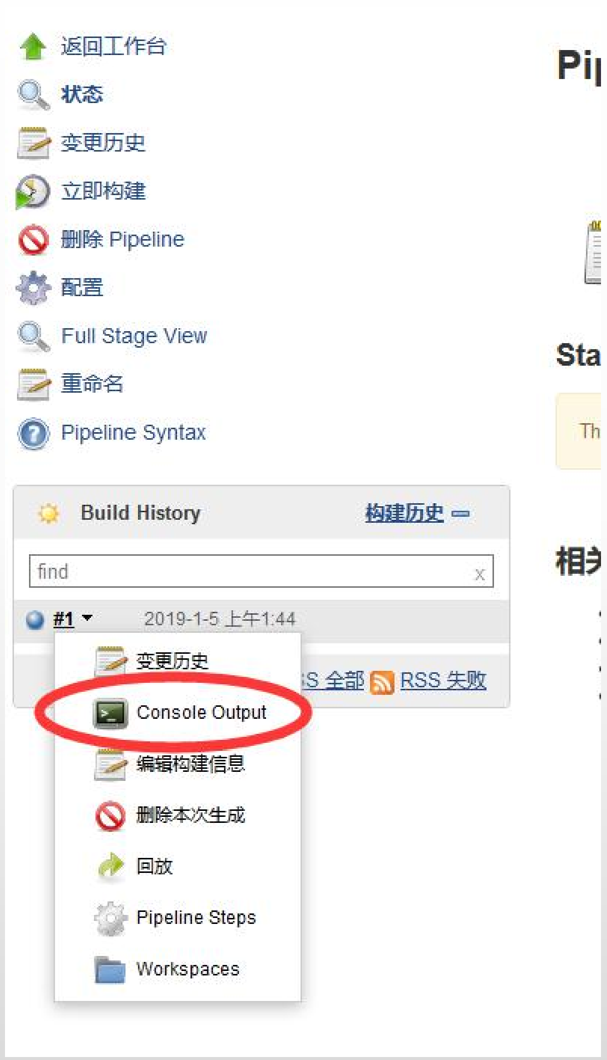
Pipeline pl_test1

hello world

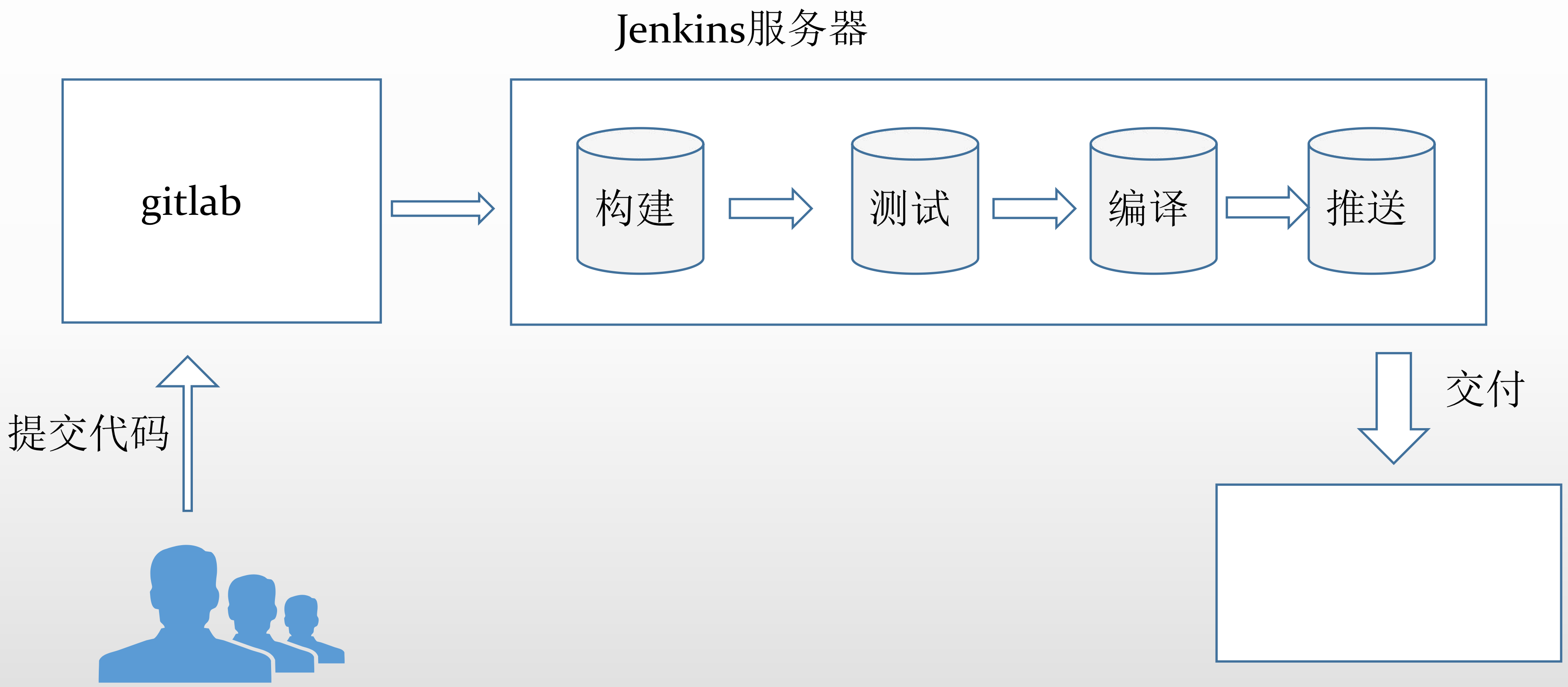
Stage View

This Pipeline has run successfully, but does not define any stages. Please use the `stage` step to define some stages in this Pipeline.

相关链接



使用gitlab+Jenkins+k8s建立CI/CD解决方案



在gitlab上创建一个project，类型为public

在客户端clone下来

创建一个Dockerfile和index.html文件

```
cat Dockerfile
        FROM docker.io/nginx
        MAINTAINER lduan
        ADD index.html /usr/share/nginx/html/

        EXPOSE 80
        CMD ["nginx", "-g","daemon off;"]
```

```
git add .
git commit -m 'xx'
git push
```

配置docker本地仓库

- docker pull registry
- docker run -d --name registry -p 5000:5000 --restart=always -v /myreg:/var/lib/registry registry

- 修改默认地址

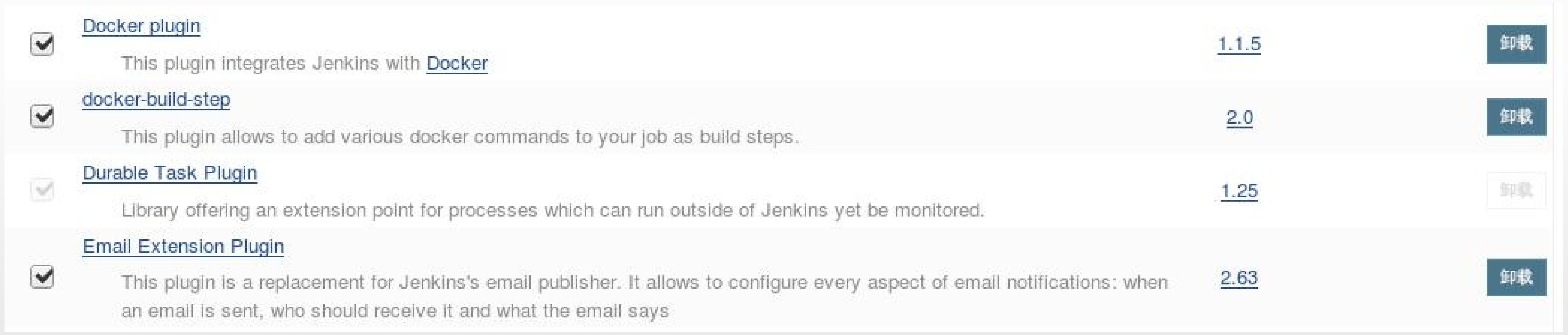
ADD_REGISTRY='--add-registry 192.168.26.70:5000'

docker使用本地仓库

```
cat /etc/docker/daemon.json
{
  "registry-mirrors": ["https://frz7i079.mirror.aliyuncs.com"],
  "insecure-registries": ["192.168.26.70:5000"]
}
curl http://192.168.26.70:5000/v2/_catalog
docker push 192.168.26.70:5000/rhce/busybox
docker pull 192.168.26.70:5000/rhce/busybox 或者
curl -XGET http://192.168.26.70:5000/v2/_catalog
curl -XGET http://192.168.26.70:5000/v2/rhce/nginx/tags/list
```

安装docker插件

- Jenkins---> 系统管理--->插件管理
- 安装所有和docker相关插件



✓	Docker plugin This plugin integrates Jenkins with Docker	1.1.5	卸载
✓	docker-build-step This plugin allows to add various docker commands to your job as build steps.	2.0	卸载
✓	Durable Task Plugin Library offering an extension point for processes which can run outside of Jenkins yet be monitored.	1.25	卸载
✓	Email Extension Plugin This plugin is a replacement for Jenkins's email publisher. It allows to configure every aspect of email notifications: when an email is sent, who should receive it and what the email says	2.63	卸载

配置gitlab和Jenkins联动

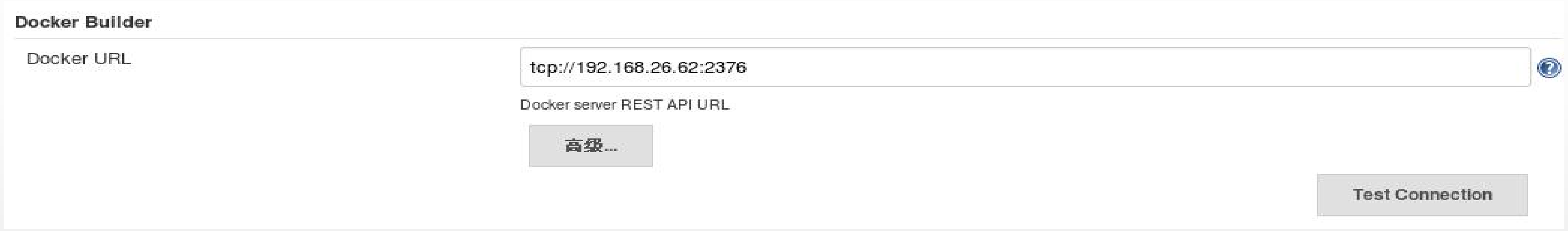
Jenkins的设置

系统管理-->系统设置

docker设置

vim /etc/sysconfig/docker

OPTIONS后增加-H tcp://0.0.0.0:2376 -H unix:///var/run/docker.sock

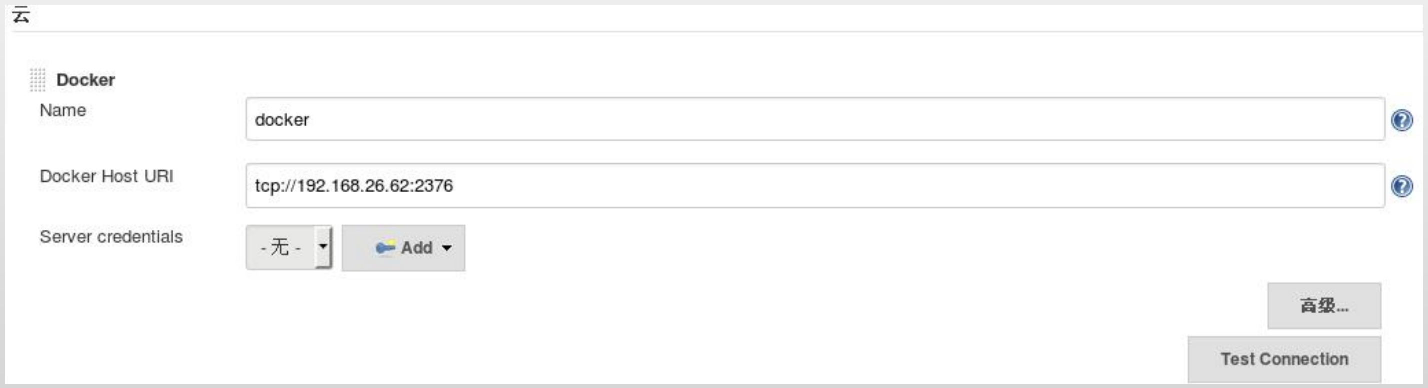


Docker Builder

Docker URL: tcp://192.168.26.62:2376

Docker server REST API URL

跳到最下，增加云



云

Docker

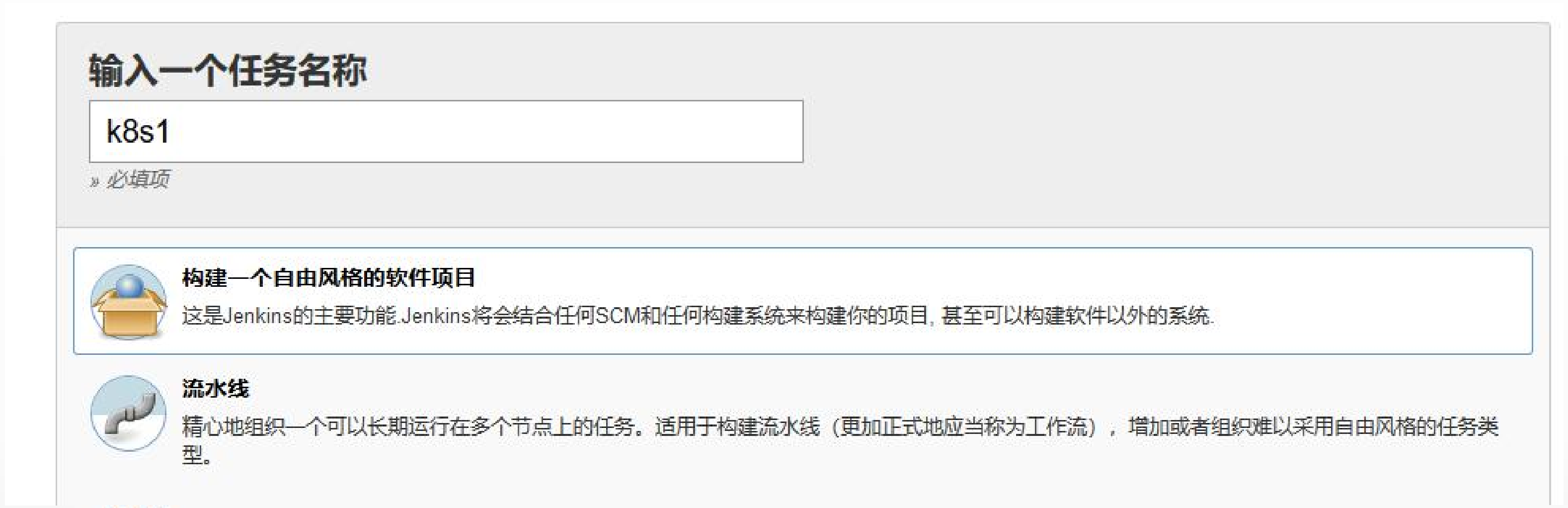
Name: docker

Docker Host URI: tcp://192.168.26.62:2376

Server credentials: - 无 -

请仔细填写并验证，否则会出现错误

新建工程



输入一个任务名称

k8s1

» 必填项

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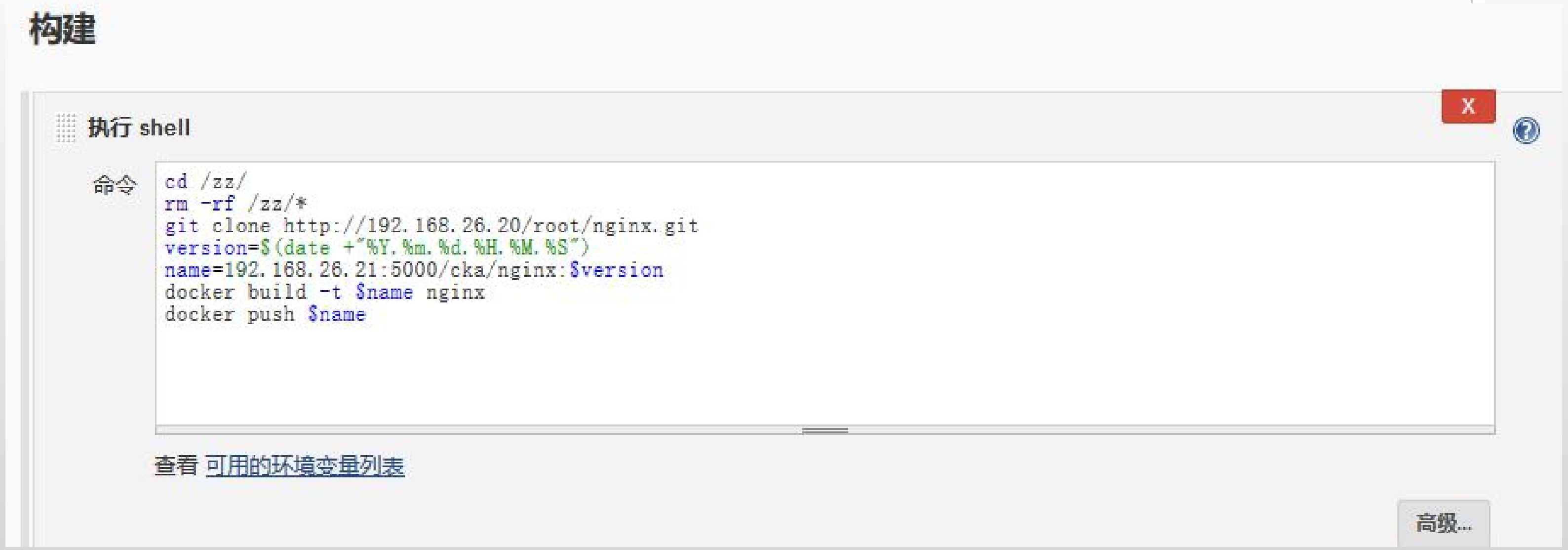
流水线

精心地组织一个可以长期运行在多个节点上的任务。适用于构建流水线（更加正式地应当称为工作流），增加或者组织难以采用自由风格的任务类型。



构建

执行 shell

命令

```
cd /zz/
rm -rf /zz/*
git clone http://192.168.26.20/root/nginx.git
version=$(date +"%Y.%m.%d.%H.%M.%S")
name=192.168.26.21:5000/cka/nginx:$version
docker build -t $name nginx
docker push $name
```

查看 可用的环境变量列表

```
mkdir /zz
chown jenkins.jenkins /zz
```

在编译过程中，如果出现
Got permission denied while trying to connect to the Docker daemon socket

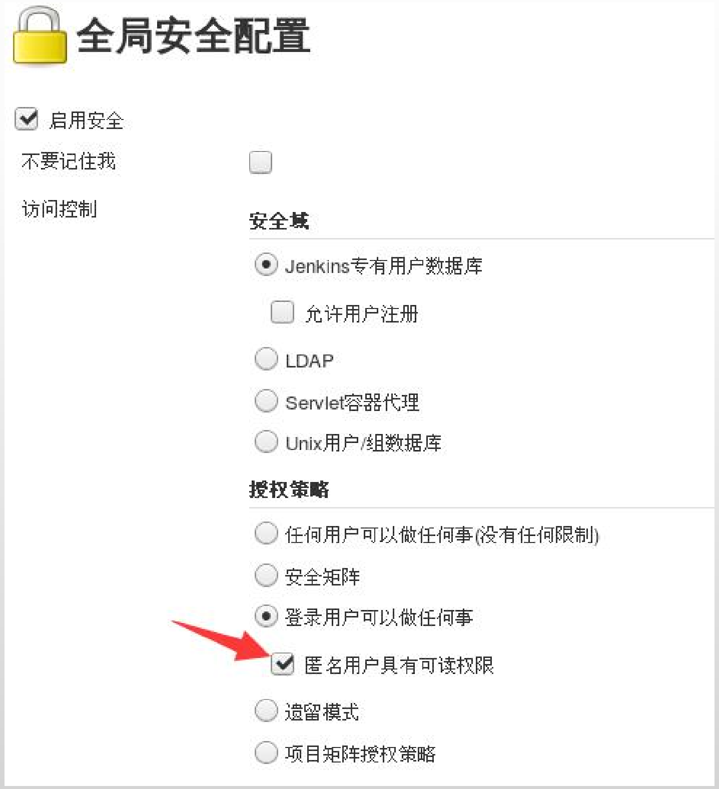
在把jenkins加入到root组，同时重启jenkins

```
/etc/init.d/jenkins restart
```

配置gitlab和Jenkins联动

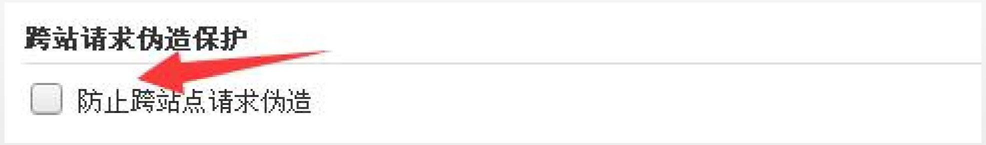
Jenkins的设置

系统管理-->全局安全设置



全局安全配置

- [✓] 启用安全
- 不要记住我 [ ]
- 访问控制
  - 安全域
    - [● Jenkins专有用户数据库]
      - [ ] 允许用户注册
    - ○ LDAP
    - ○ Servlet容器代理
    - ○ Unix用户/组数据库
  - 授权策略
    - ○ 任何用户可以做任何事(没有任何限制)
    - ○ 安全矩阵
    - [● 登录用户可以做任何事]
      - [✓] 匿名用户具有可读权限
    - ○ 遗留模式
    - ○ 项目矩阵授权策略

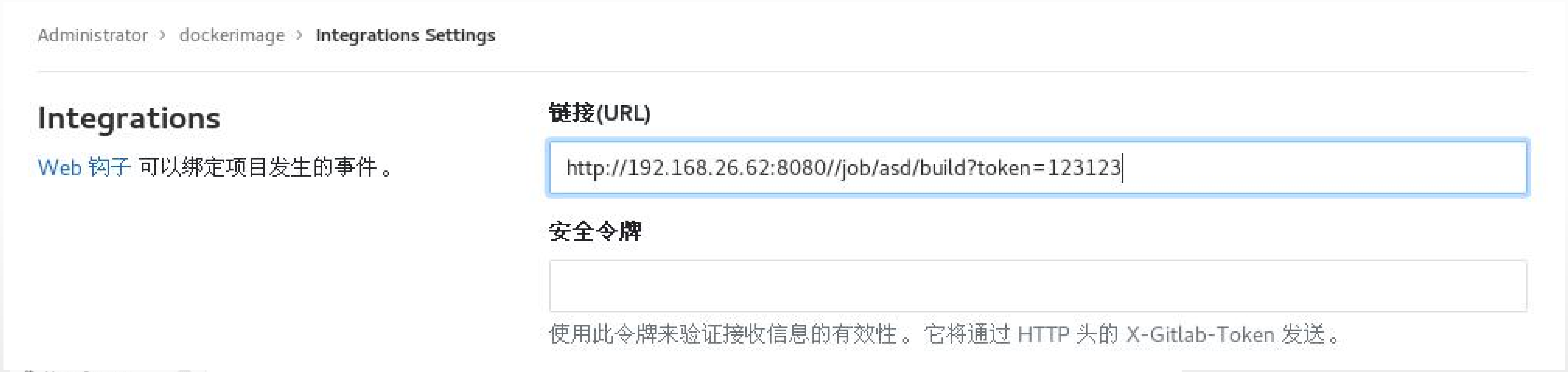


跨站请求伪造保护

- [ ] 防止跨站点请求伪造

创建Jenkins工程和gitlab工程关联

- 在gitlab上设置



Administrator › dockerimage › Integrations Settings

Integrations

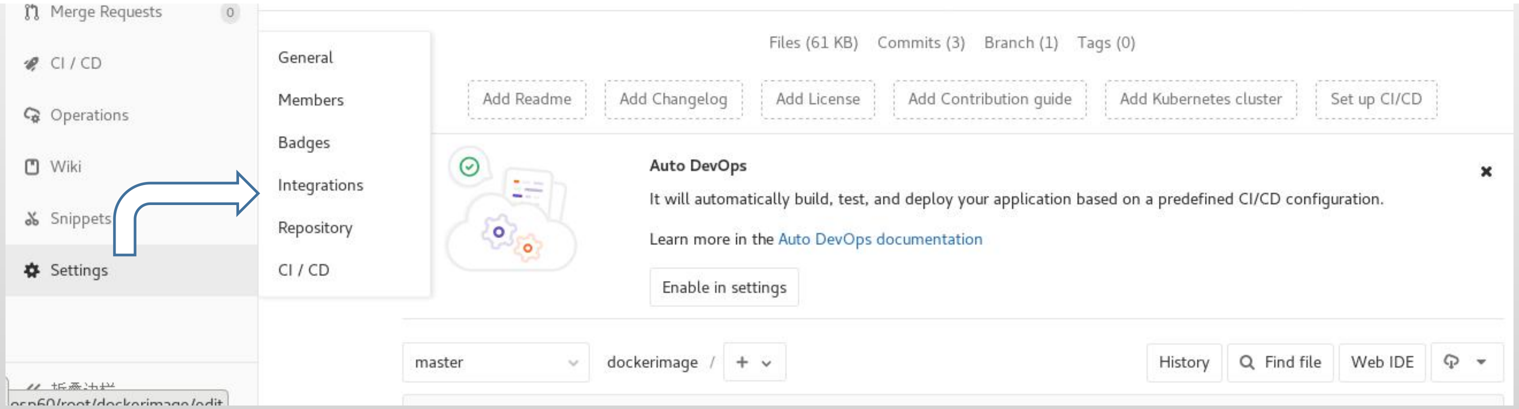
Web 钩子 可以绑定项目发生的事件。

链接(URL)

http://192.168.26.62:8080//job/asd/build?token=123123

安全令牌

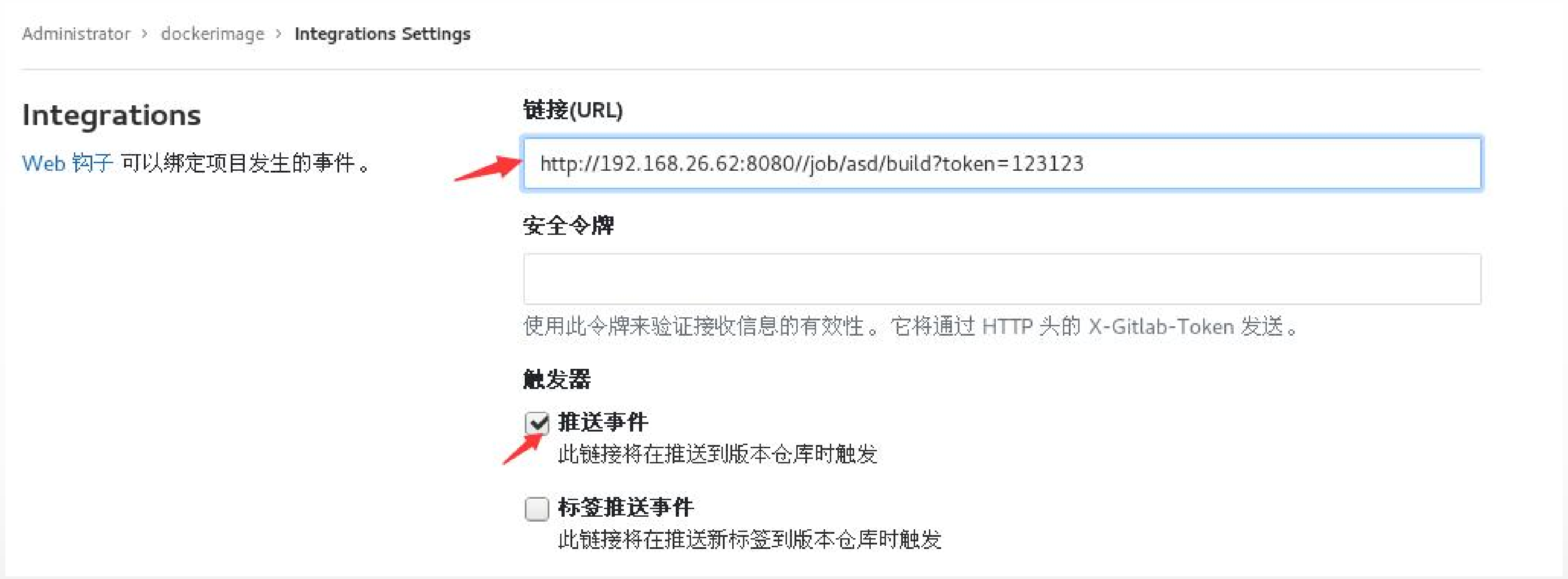
使用此令牌来验证接收信息的有效性。它将通过 HTTP 头的 X-Gitlab-Token 发送。



Auto DevOps

It will automatically build, test, and deploy your application based on a predefined CI/CD configuration.

Learn more in the Auto DevOps documentation



Administrator › dockerimage › **Integrations Settings**

Integrations

Web 钩子 可以绑定项目发生的事件。

链接(URL)

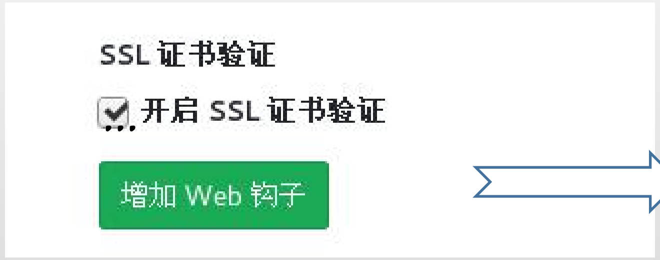
http://192.168.26.62:8080//job/asd/build?token=123123

安全令牌

使用此令牌来验证接收信息的有效性。它将通过 HTTP 头的 X-Gitlab-Token 发送。

触发器

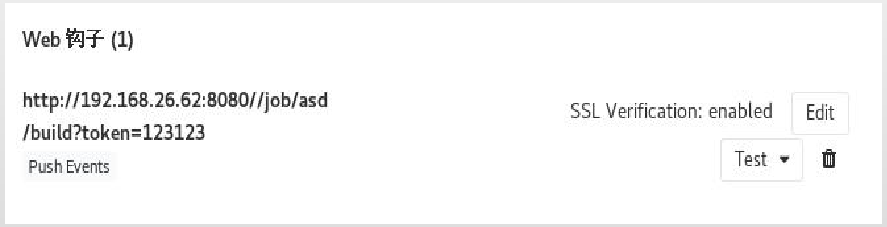
- [x] **推送事件**
  此链接将在推送到版本仓库时触发
- [ ] **标签推送事件**
  此链接将在推送新标签到版本仓库时触发



SSL 证书验证

- [x] **开启 SSL 证书验证**

增加 Web 钩子



Web 钩子 (1)

http://192.168.26.62:8080//job/asd/build?token=123123

Push Events

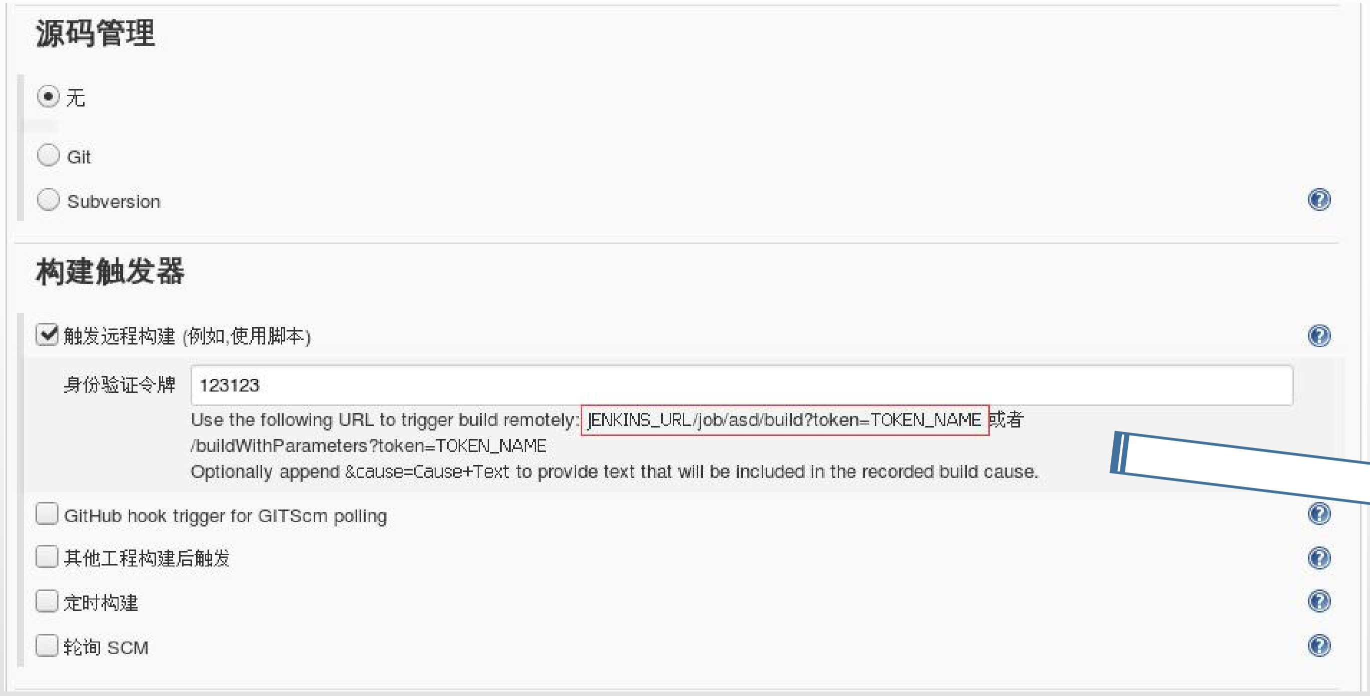
SSL Verification: enabled

Edit

Test

创建Jenkins工程和gitlab工程关联

在Jenkins工程里创建构建触发器



源码管理

- (●) 无
- ( ) Git
- ( ) Subversion

构建触发器

[✓] 触发远程构建 (例如,使用脚本)

身份验证令牌: 123123

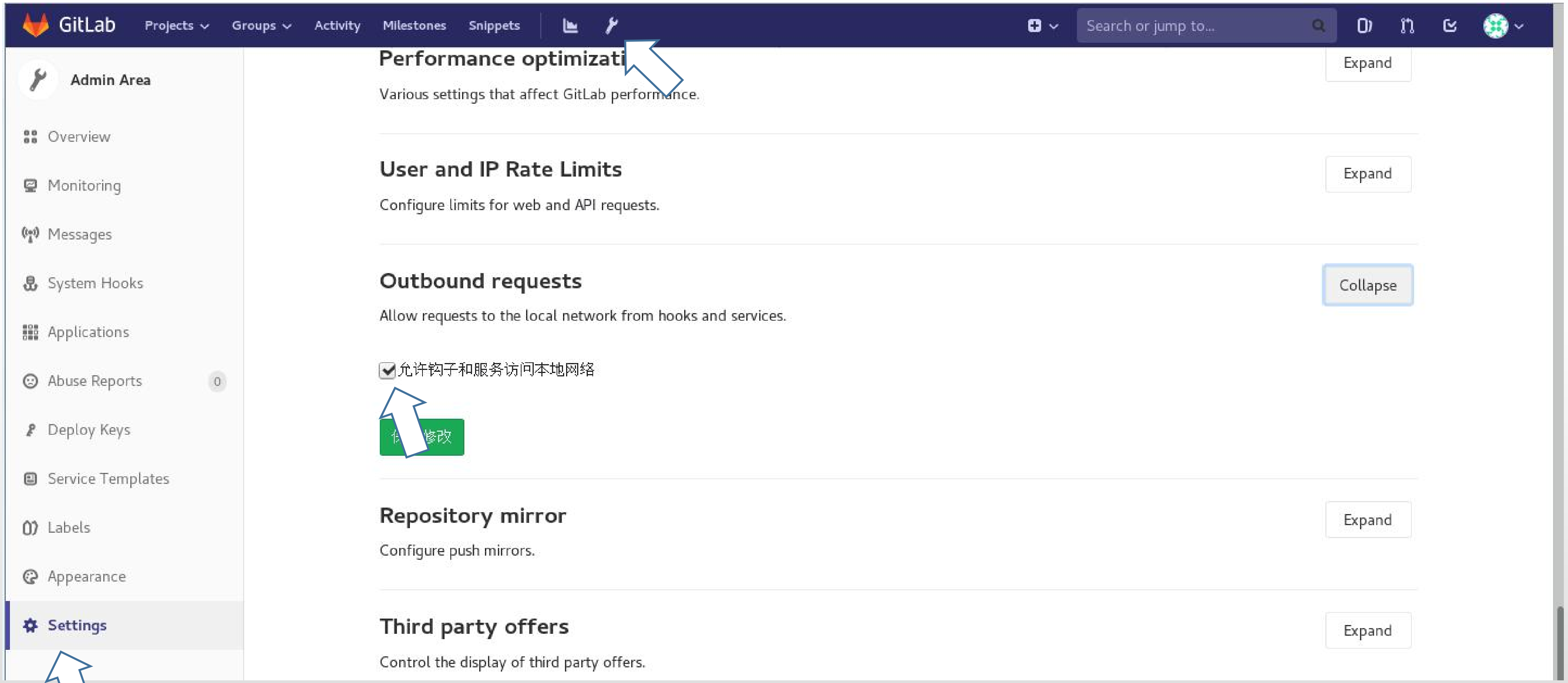
Use the following URL to trigger build remotely: JENKINS_URL/job/asd/build?token=TOKEN_NAME 或者 /buildWithParameters?token=TOKEN_NAME
Optionally append &cause=Cause+Text to provide text that will be included in the recorded build cause.

- [ ] GitHub hook trigger for GITScm polling
- [ ] 其他工程构建后触发
- [ ] 定时构建
- [ ] 轮询 SCM

此处身份令牌可以随便写

注意下面圈起来的部分，这部分是要填写到gitlab里的

如遇：url is blocked:requests to local



Performance optimizati

Various settings that affect GitLab perform nce.

Expand

User and IP Rate Limits

Configure limits for web and API requests.

Expand

Outbound requests

Allow requests to the local network from hooks and services.

Collapse

[✓] 允许钩子和服务访问本地网络

保 修改

Repository mirror

Configure push mirrors.

Expand

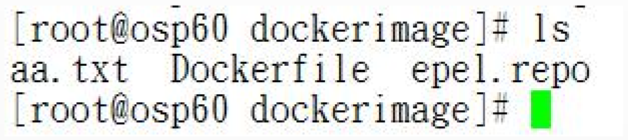
Third party offers

Control the display of third party offers.

Expand

测试提交代码自动触发jenkins

- git clone http://osp60/root/dockerimage.git
- cd dockerimage/



```
[root@osp60 dockerimage]# ls
aa.txt  Dockerfile  epel.repo
[root@osp60 dockerimage]# 
```

- git add .
- git commit -m 'xx'
- git push

部署CI/CD

在k8s上运行一个deployment nginx，并创建服务

为tom设置权限

```
kubectl create clusterrolebinding myclusterbind1 --clusterrole=cluster-admin --
user=tom
```

在客户端上测试

```
kubectl -s="https://192.168.26.51:6443" --insecure-skip-tls-verify=true --
username="tom" --password="redhat" get pods -n ns01

kubectl -s="https://192.168.26.10:6443" --insecure-skip-tls-verify=true --
username="tom" --password="redhat" get pods -n ns02
```

设置权限

```
cat /etc/sudoers.d/jenkins
jenkins    ALL=(root) NOPASSWD: /usr/bin/rm
```

构建的shell

```
cd /zz/
sudo rm -rf /zz/*
git clone http://192.168.26.20/root/nginx.git
version=$(date +"%Y.%m.%d.%H.%M.%S")
name=192.168.26.21:5000/cka/nginx:$version
docker build -t $name nginx
docker push $name
kubectl -s="https://192.168.26.51:6443" --insecure-skip-tls-verify=true --username="tom" --
password="redhat"  set image deployment/nginx  nginx="$name" -n ns01
```

谢谢