Golang 代码质量持续检测

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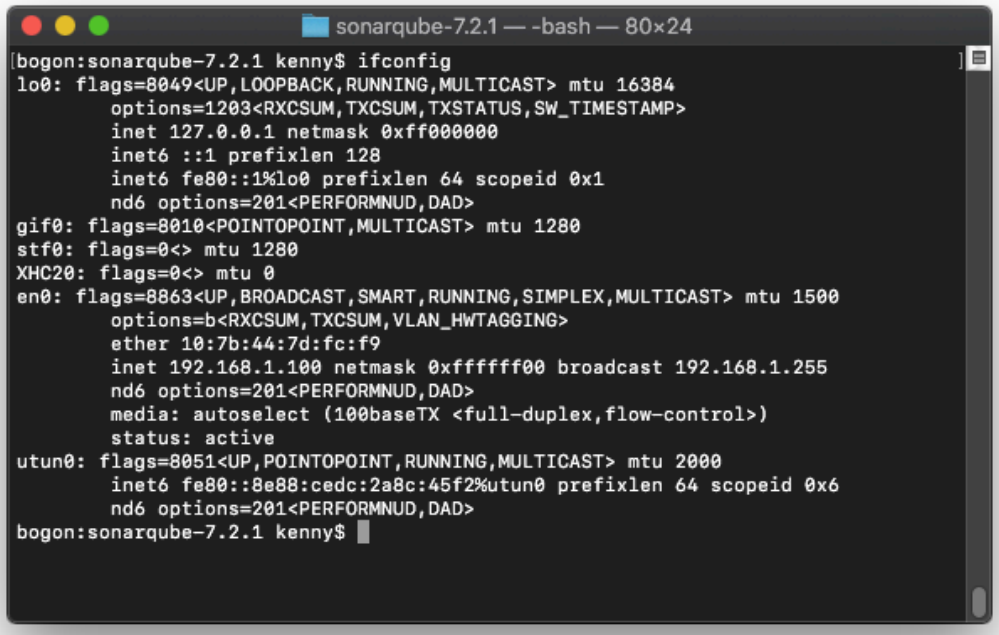
前言

在软件开发过程中，人工检查项目代码中的漏洞和潜在的 BUG 是一件让人十分费神费力的事情，为了解决这一痛点，SonarQube诞生了，它实现了一系列代码自动检测过程，包括命名规范，代码漏洞，代码重复量等。

但是光有 SonarQube 还不能发挥出应有的高效率，一个完整的代码质量持续检测应配合代码仓库(如 gitlab) 和 Jenkins 来共同构建一个自动化过程。

环境

- Gitlab、Jenkins、SonarQube 服务都在一台物理机上的Docker中运行
- 网络 (局域网IP：192.168.1.100)



- 主机科学上网代理

  192.168.1.100:1087
- 模拟外网访问

```
# 修改 hosts 文件，模拟外网访问
sudo sh -c "echo '192.168.1.100 jenkins.kenny.com\n192.168.1.100
gitlab.kenny.com\n192.168.1.100 sonarqube.kenny.com' >> /etc/hosts"
```

- 工具集

名称	版本
golang	go1.10.3
docker	18.03.1-ce

搭建

接下来，我以一个完整的案例来介绍搭建过程。

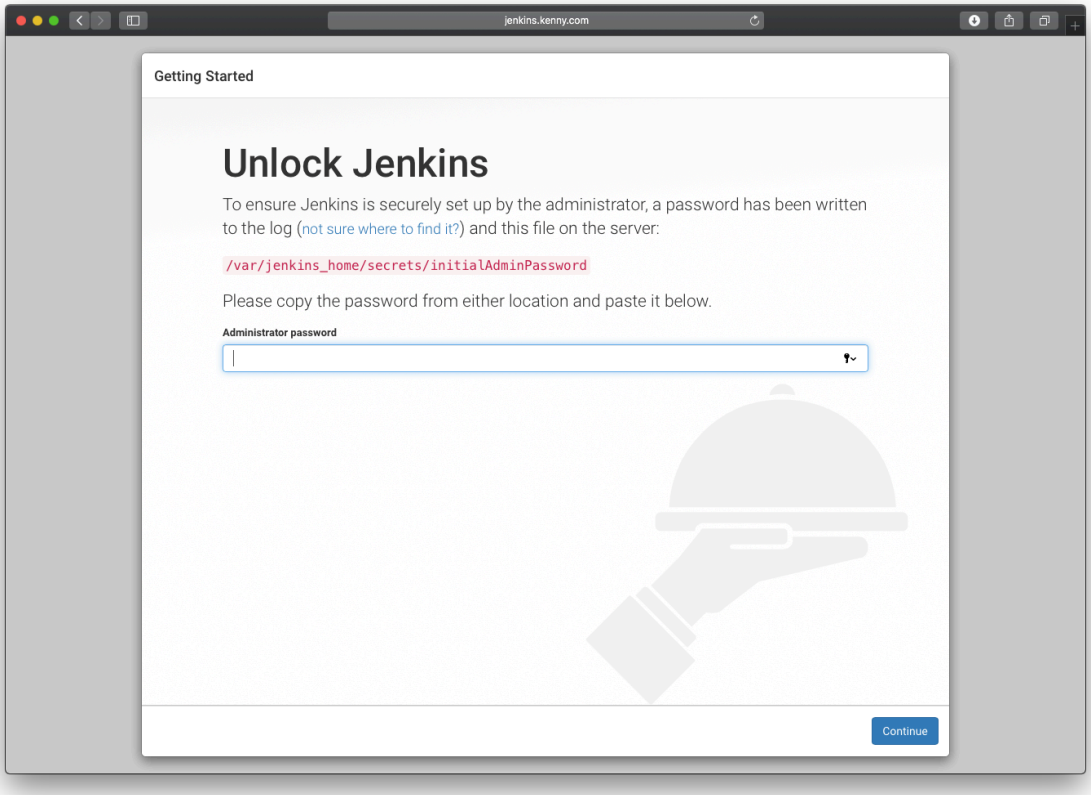
Jenkins

启动服务

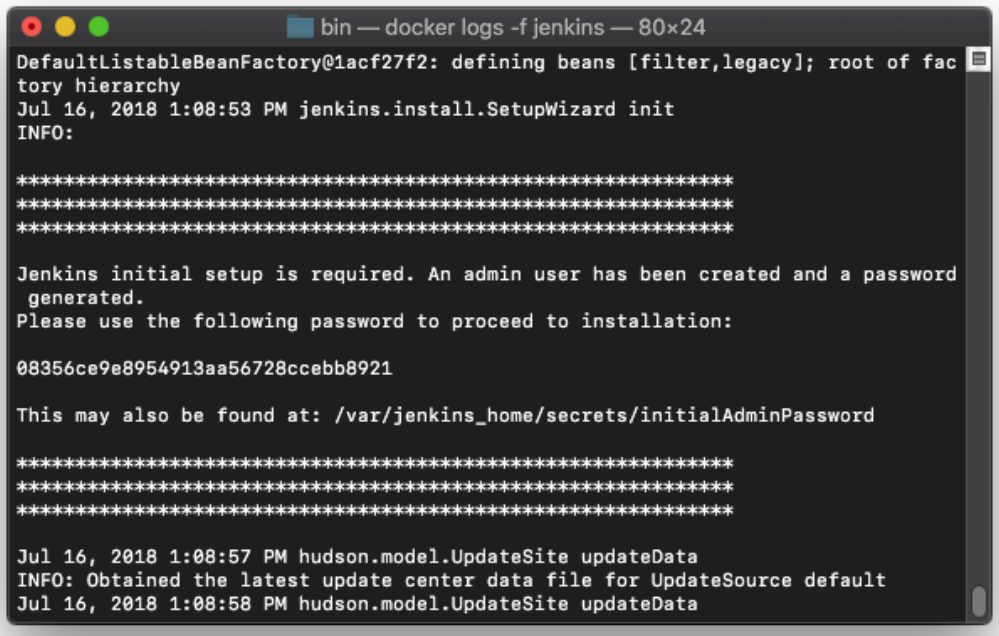
```
# $jenkins_home 宿主机目录，挂载容器 /var/jenkins_home
# 我的数据卷目录是 ~/.jenkins
export JENKINS_HOME=~/.jenkins
docker run -d --restart=always -p 8080:8080 -p 50000:50000 -v
$JENKINS_HOME:/var/jenkins_home --name jenkins jenkins

# 查看 jenkins 日志
docker logs -f jenkins
```

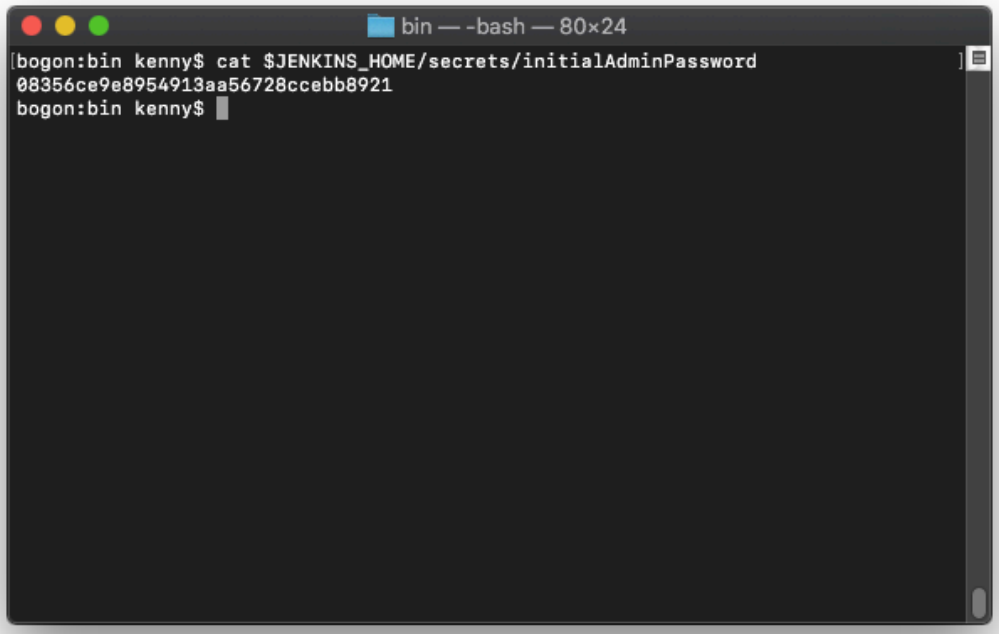
初始化

1. 打开浏览器，访问 http://jenkins.kenny.com:8080

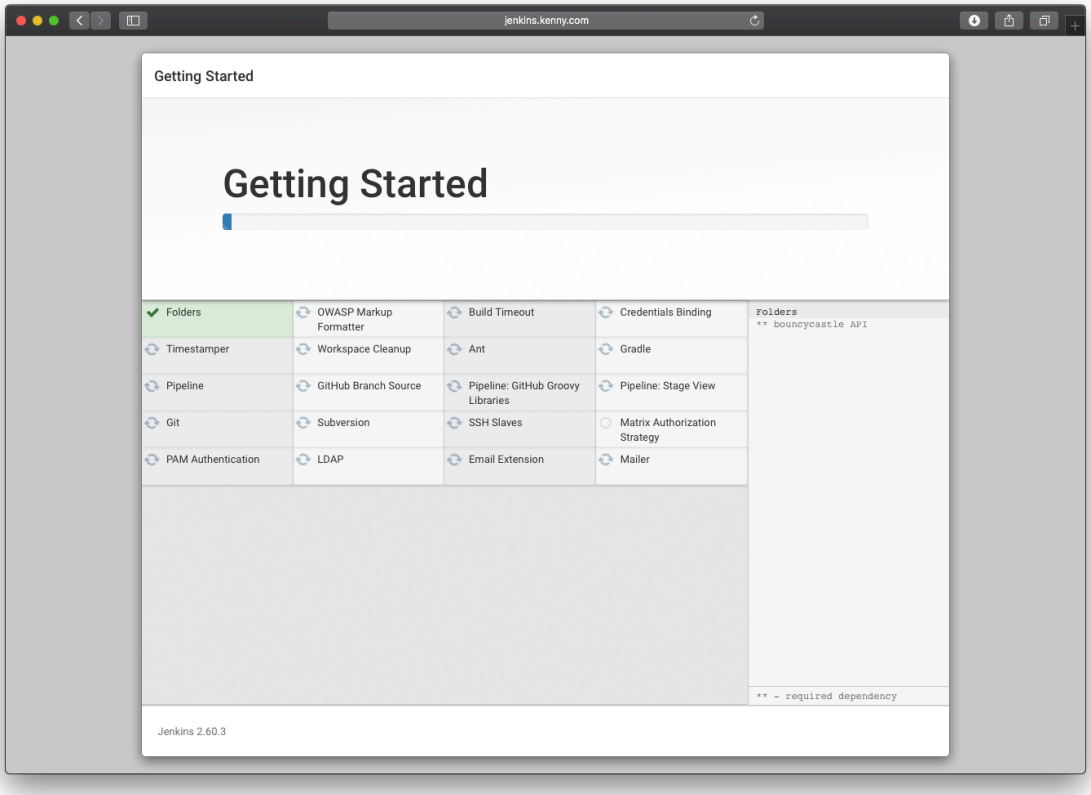



```
# 在日志中找到管理员密码
docker logs -f jenkins

# 或者在 $JENKINS_HOME/secrets/initialAdminPassword 文件中找到管理员密码
cat $JENKINS_HOME/secrets/initialAdminPassword
```

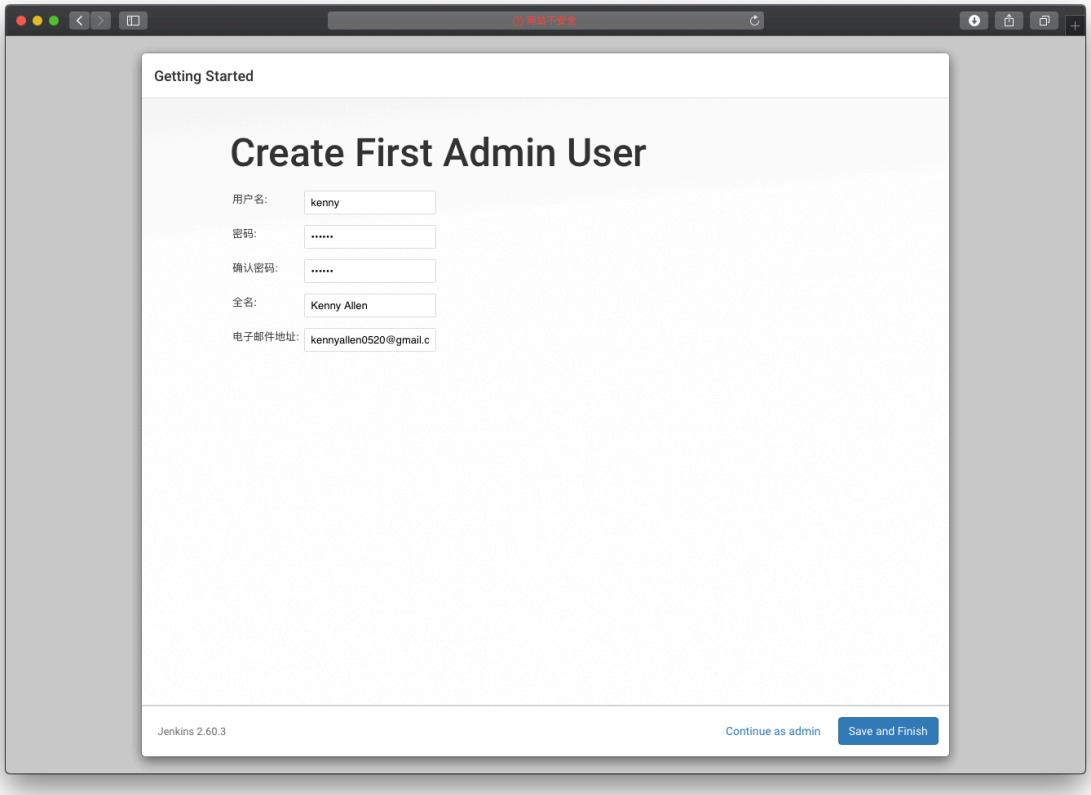




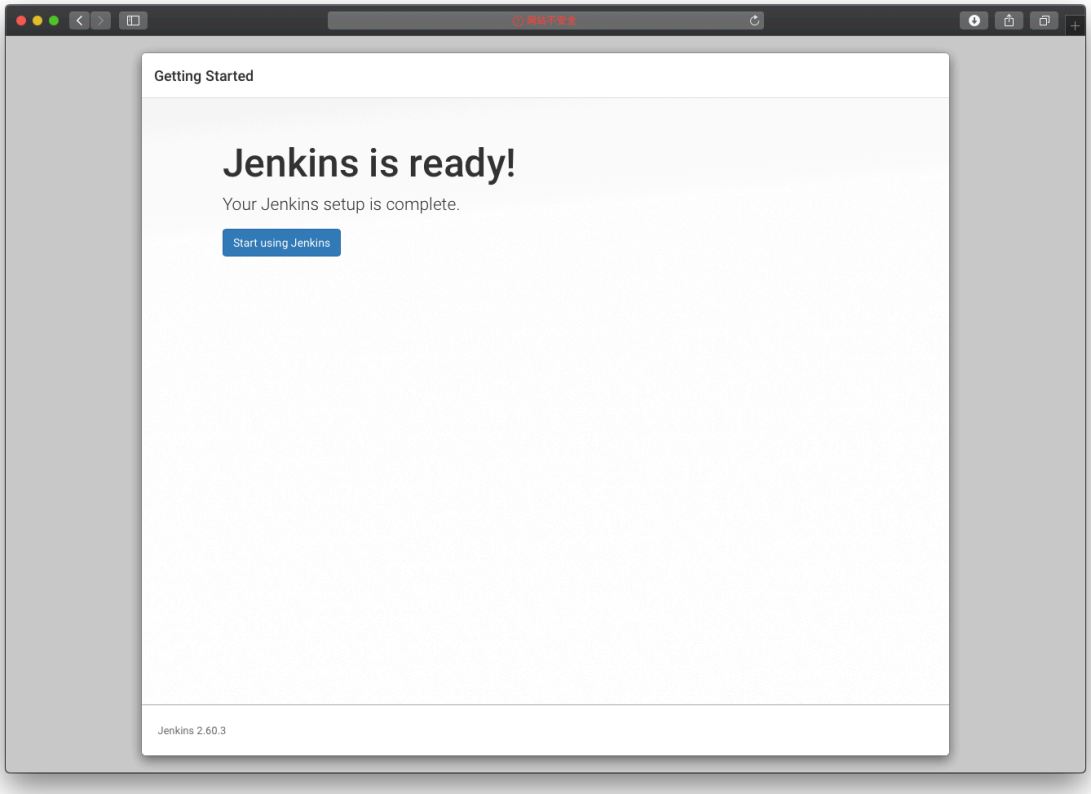
2. 安装推荐插件 (如果你想自定义安装插件，点击 Select plugins to Install)



3. 创建管理员账号



4. 初始化完成



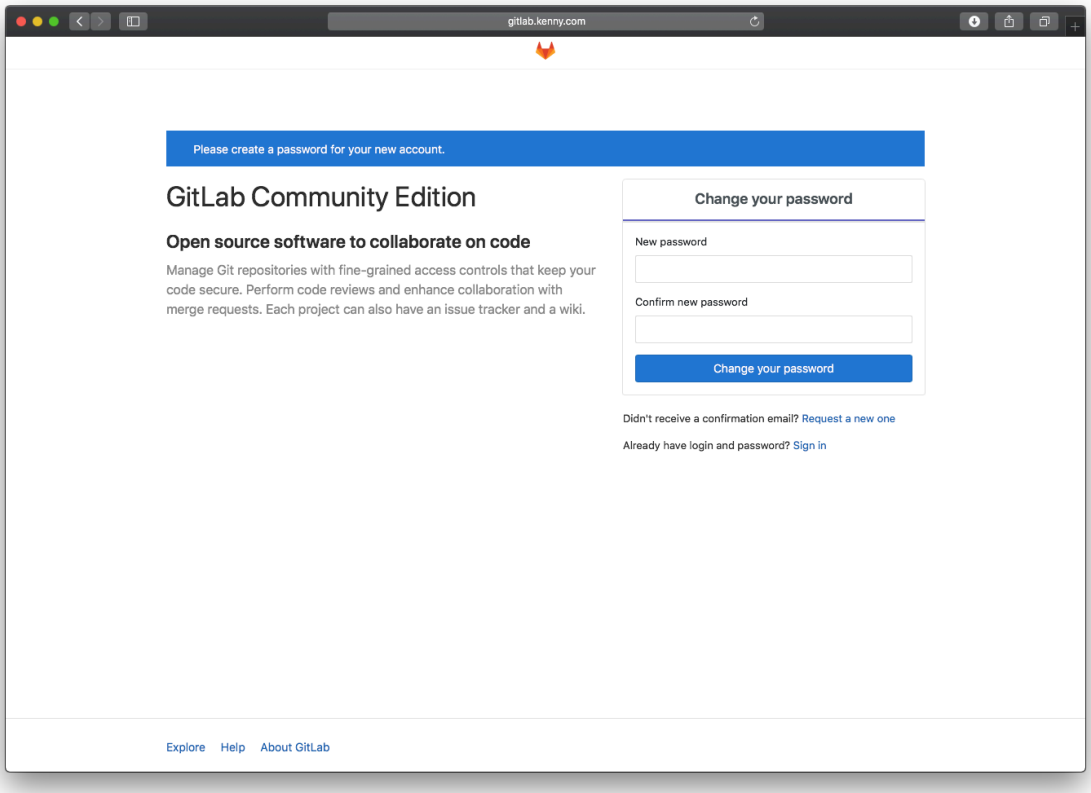
Gitlab

启动服务 (gitlab 集成的服务比较多，因此需要占用较大的内存，官方推荐4GB以上)

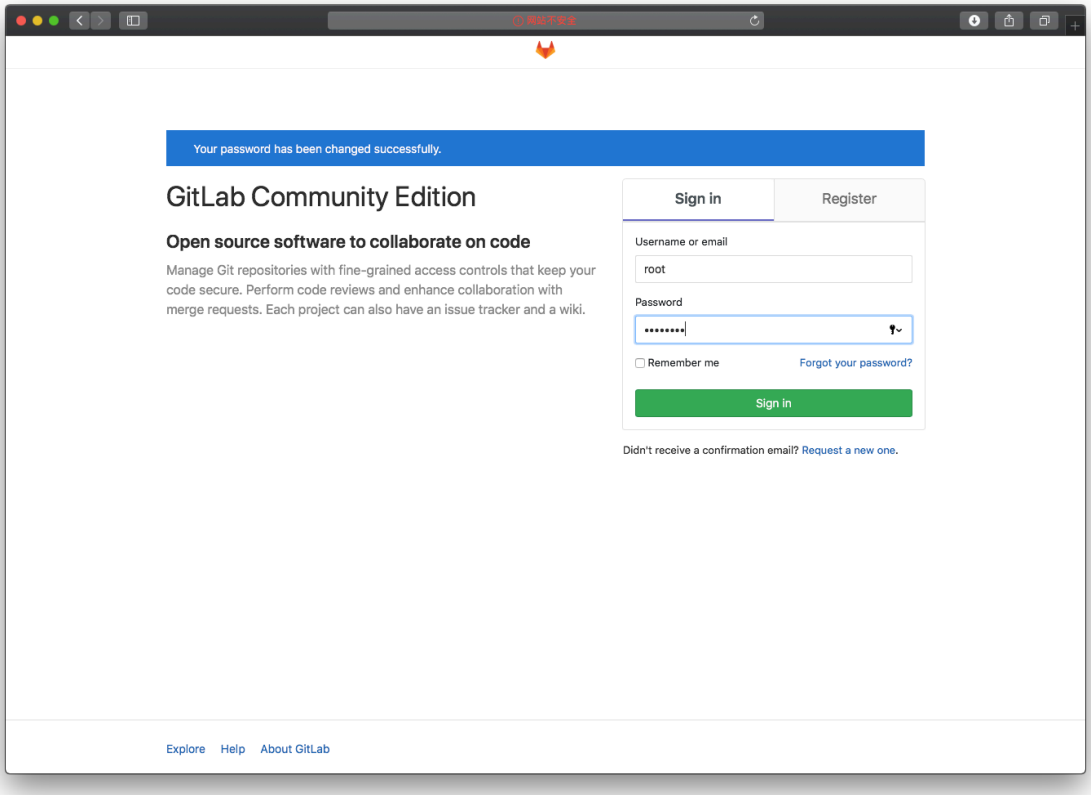
```
# $gitlab_home 宿主机目录
# 我的数据卷目录是 ~/.gitlab
export GITLAB_HOME=~/.gitlab
docker run -d --restart=always -e 'GITLAB_HOST=gitlab.kenny.com' -p 443:443
-p 80:80 -p 22:22 -v $GITLAB_HOME/conf:/etc/gitlab -v
$GITLAB_HOME:/var/opt/gitlab -v $GITLAB_HOME/log:/var/log/gitlab --name
gitlab gitlab/gitlab-ce

# 查看 gitlab 日志
docker logs -f gitlab
```

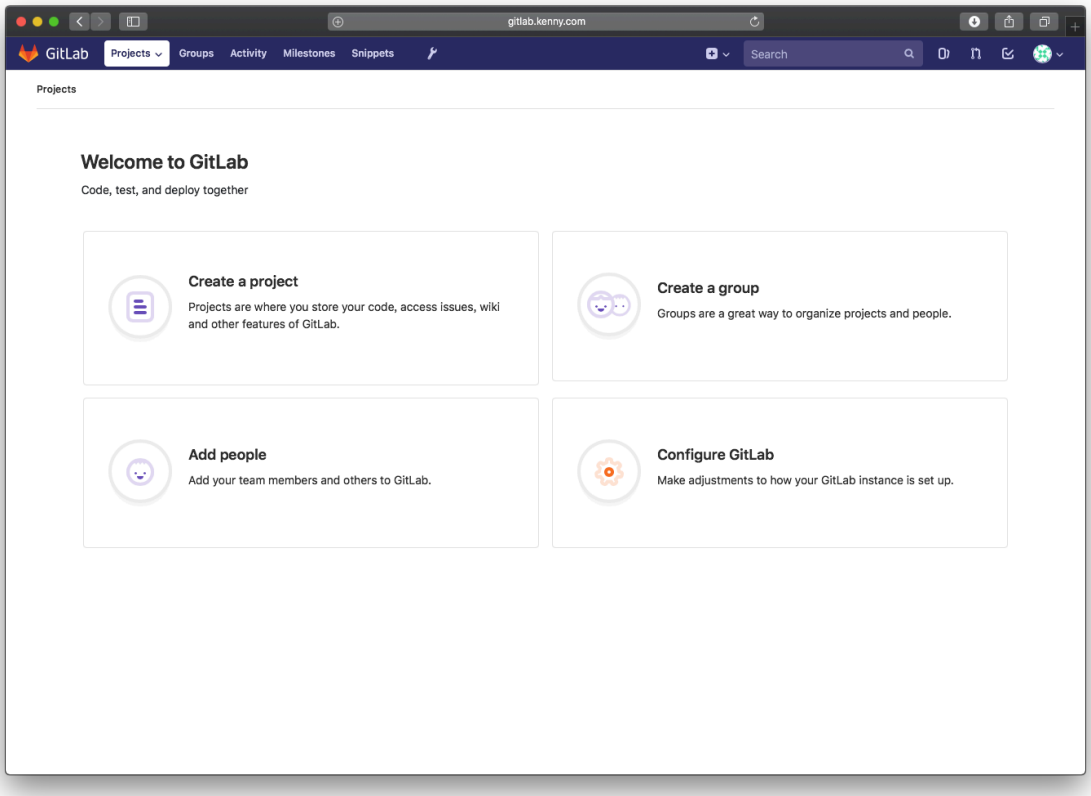
初始化

1. 打开浏览器，访问 http://gitlab.kenny.com

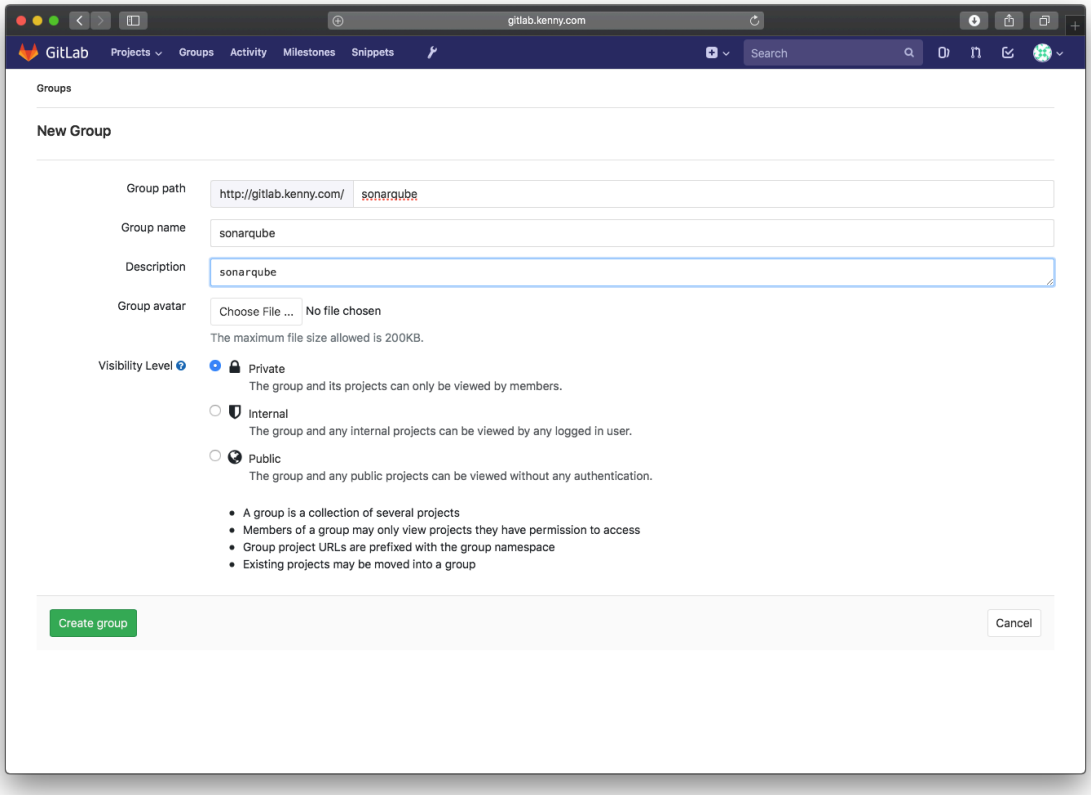


2. 设置新密码后，使用 root 用户登录

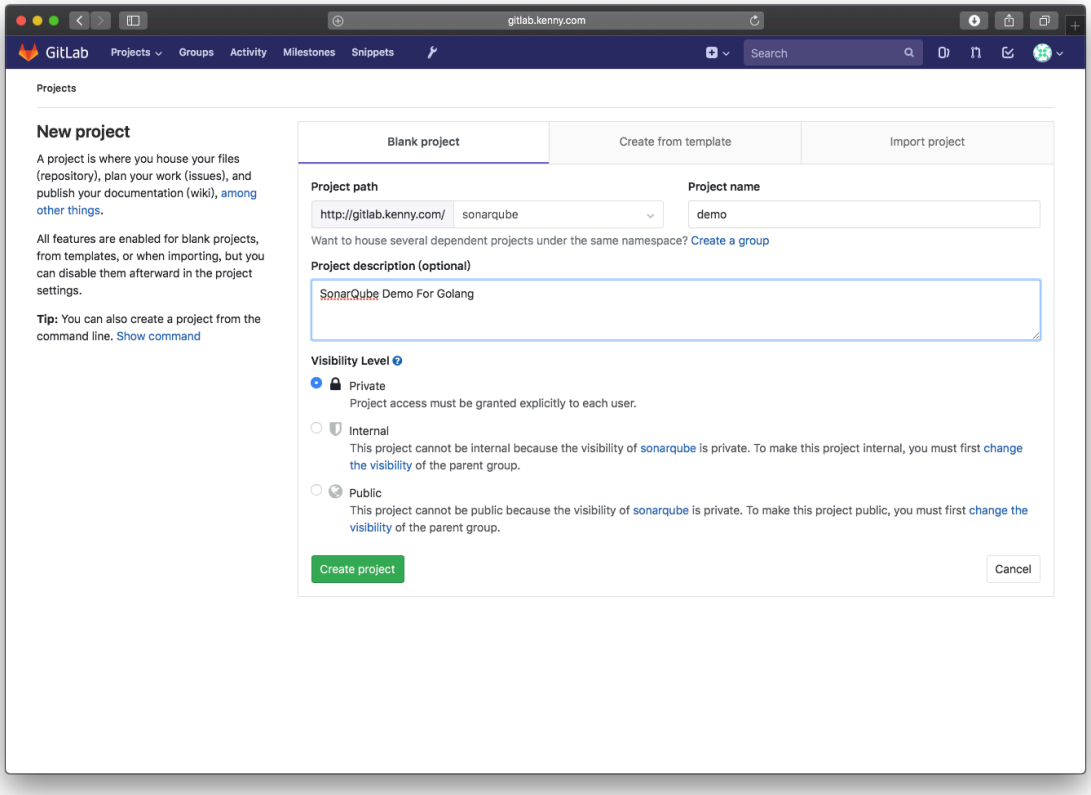


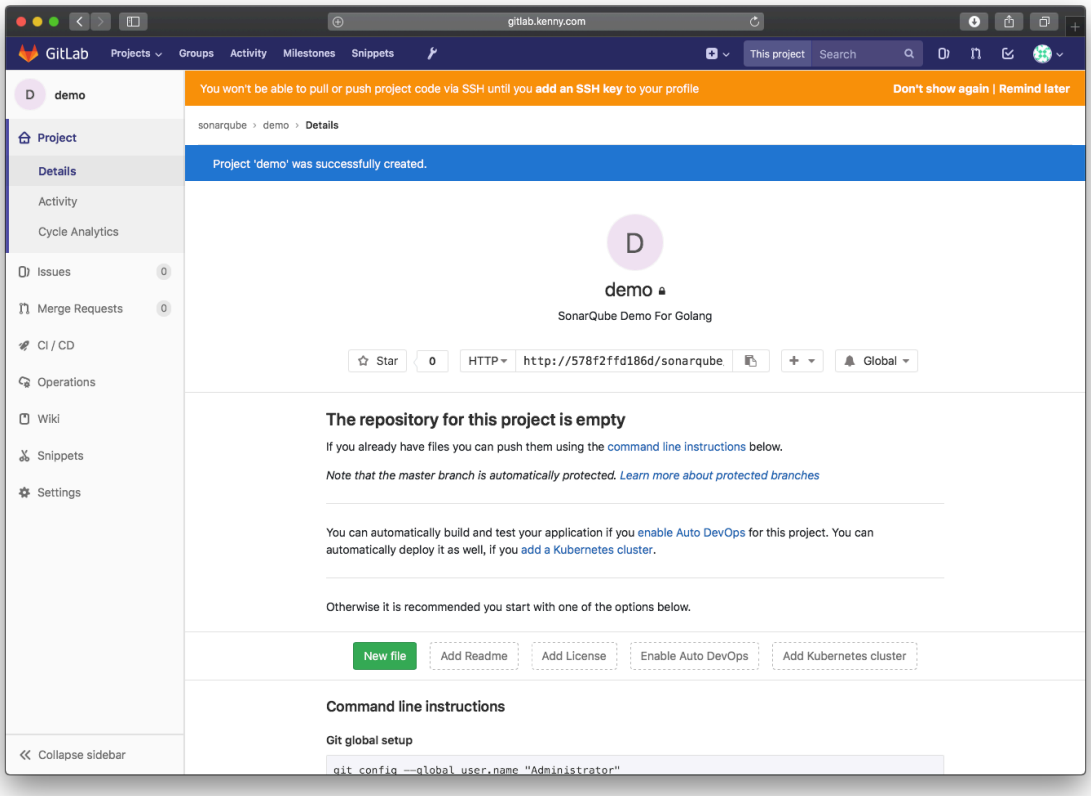


3. 新建 sonarqube 项目组



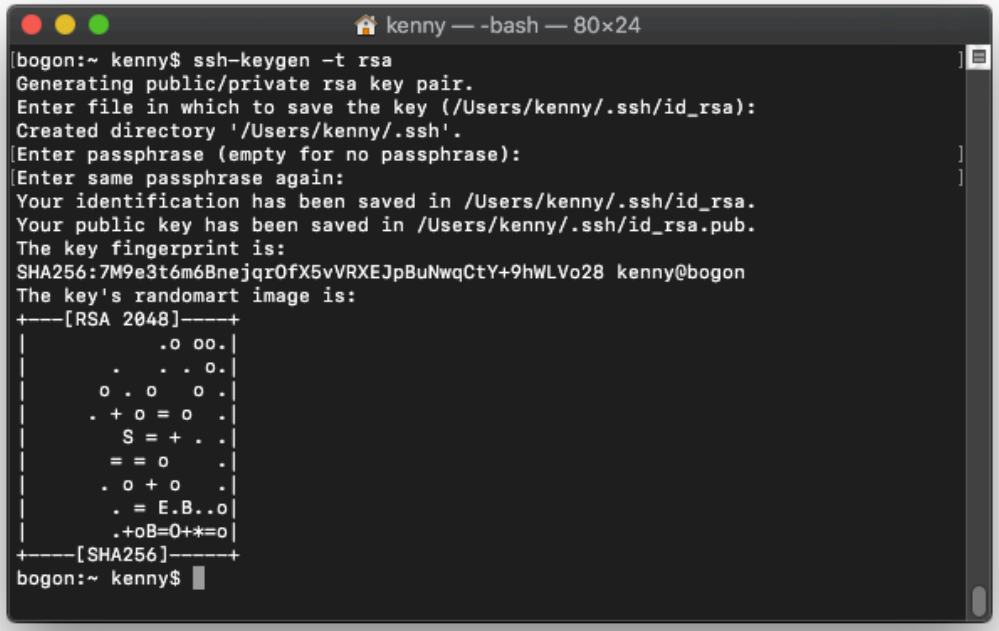
4. 在 sonarqube 项目组下新建 demo 项目

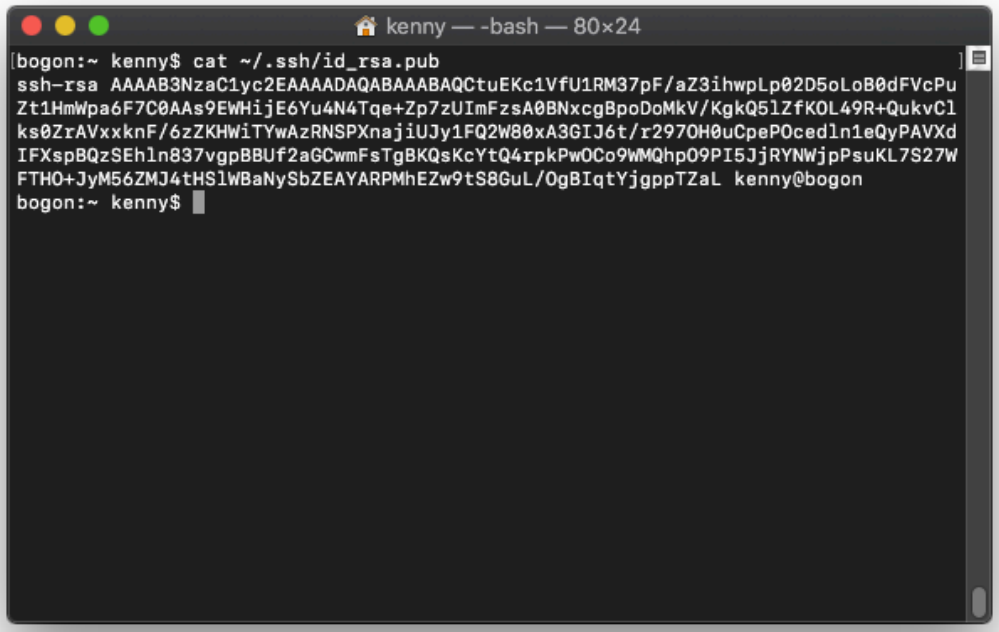




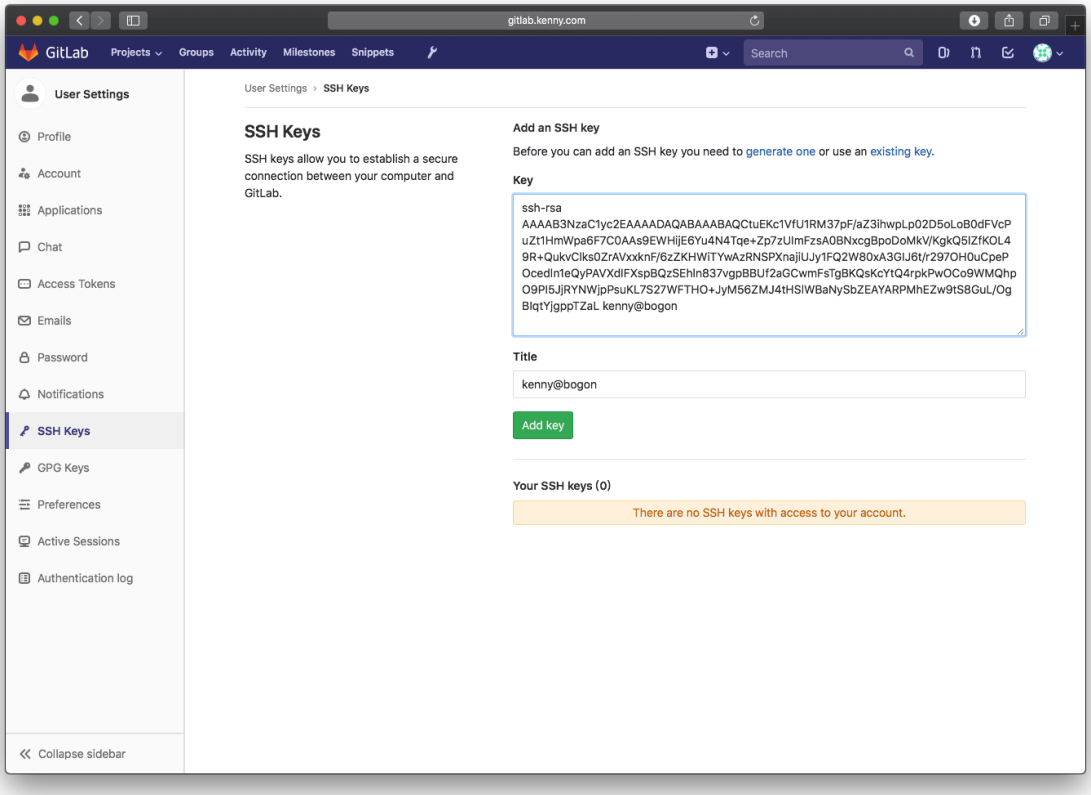
5. 添加主机公钥到 Gitlab

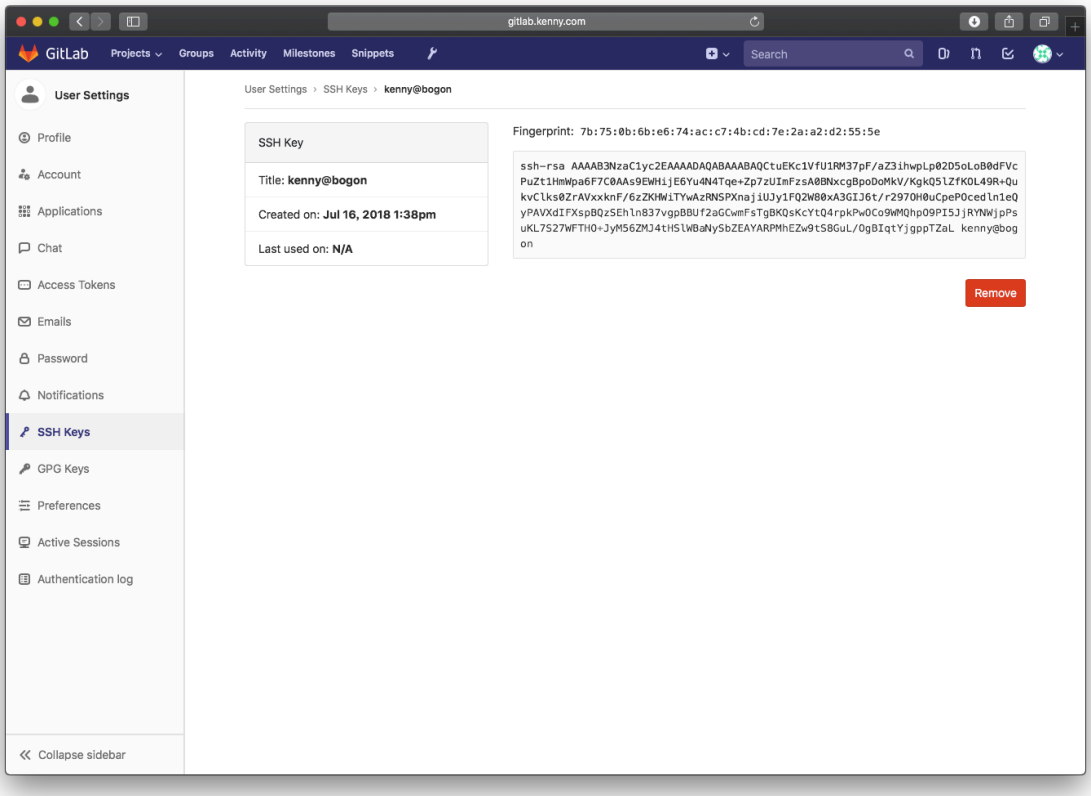
```
# 生成 rsa 公钥和密钥
ssh-keygen -t rsa

# 查看并复制公钥
cat ~/.ssh/id_rsa.pub
```





访问 http://gitlab.kenny.com/profile/keys ， 将公钥添加至 Gitlab





6. 将 sonarqube/demo 项目拉至主机的 $GOPATH 下

```
# 在 $GOPATH 下创建 gitlab.kenny.com 文件夹
mkdir -p $GOPATH/src/gitlab.kenny.com && cd
$GOPATH/src/gitlab.kenny.com

# clone code
git clone git@gitlab.kenny.com:sonarqube/demo.git
```

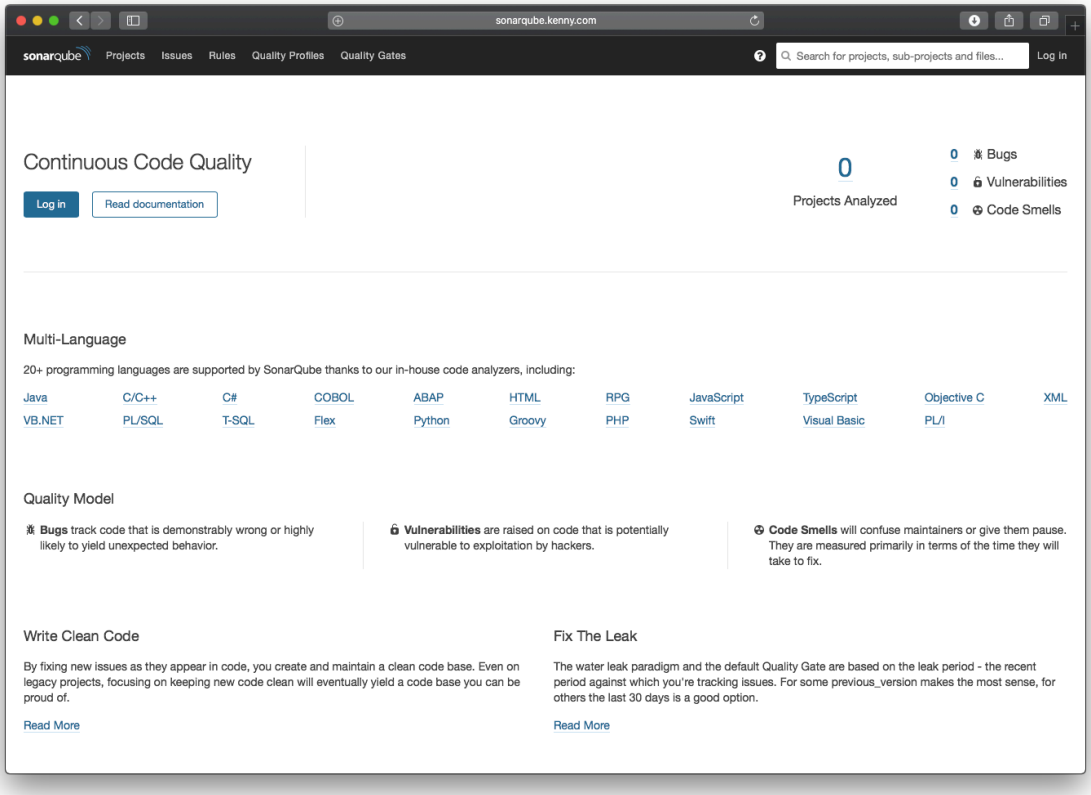
SonarQube

启动服务

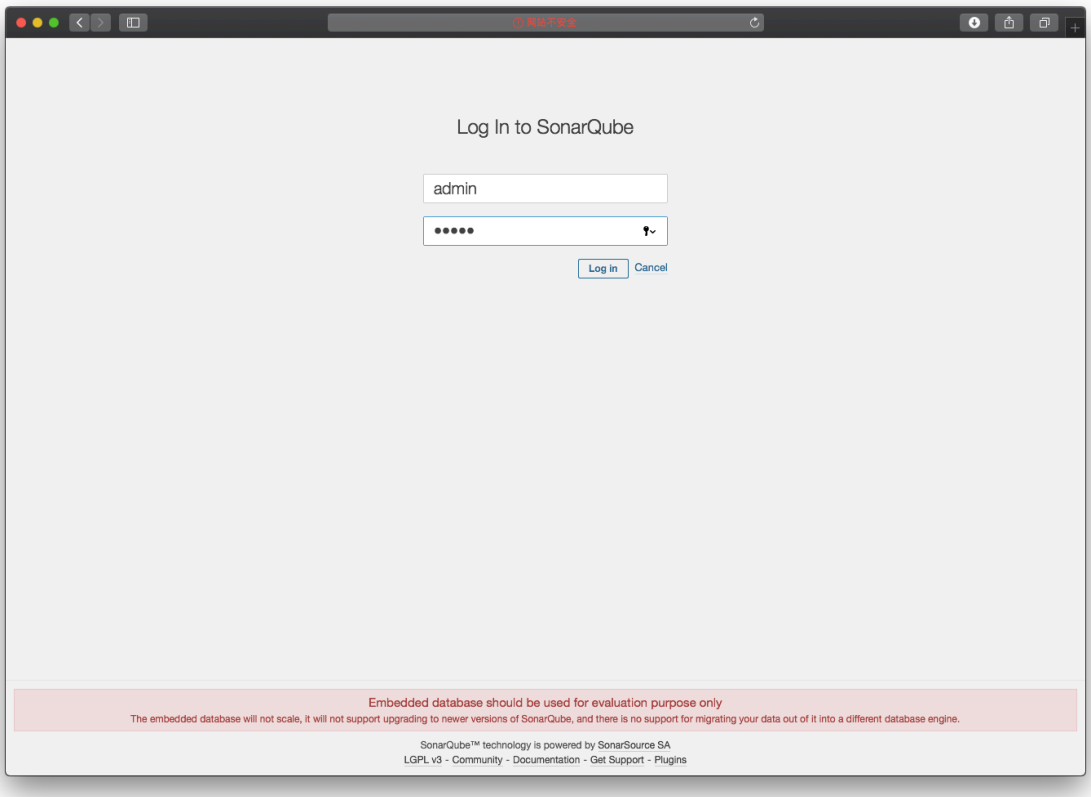
```
# 由于目前 sonarqube 官方的 Docker images/sonarqube_for_golang 只有 7.1 版本，不
满足 SonarGO 所需 7.2+ 版本，所以我参考7.1 的 Dockerfile 制作了一个 sonarqube
7.2.1 的镜像
# $sonarqube_home 宿主机目录
# 我的数据卷目录是 ~/.sonarqube
export SONARQUBE_HOME=~/.sonarqube
# 正式环境中应启用外部数据库服务来存储必要数据，在启动容器时设置如下JDBC相关参数：
# -e SONARQUBE_JDBC_USERNAME=sonar
# -e SONARQUBE_JDBC_PASSWORD=sonar
# -e SONARQUBE_JDBC_URL=jdbc:postgresql://localhost/sonar
docker run -d --restart=always -p 9000:9000 -v
$SONARQUBE_HOME:/opt/sonarqube/data --name sonarqube
kennyallen/sonarqube:7.2.1

# 查看 sonarqube 日志
docker logs -f sonarqube
```

初始化

1. 打开浏览器，访问 http://sonarqube.kenny.com:9000

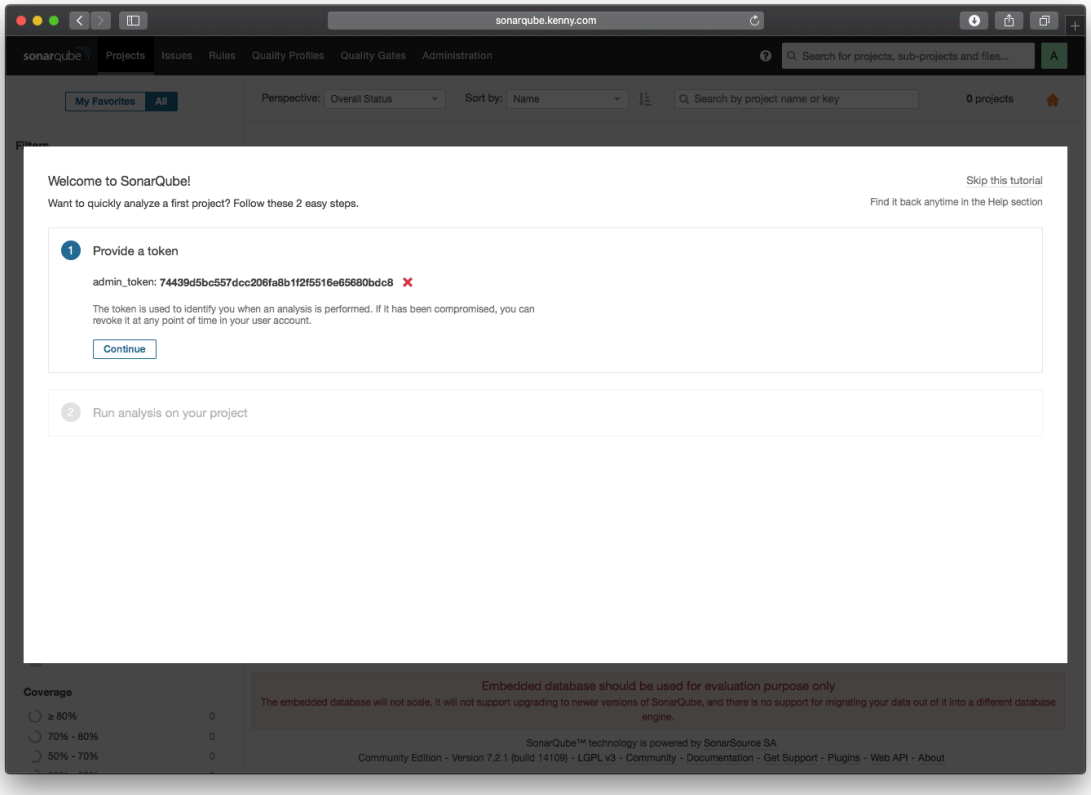


2. 使用管理员账号登录
    - 账号 admin
    - 密码 admin

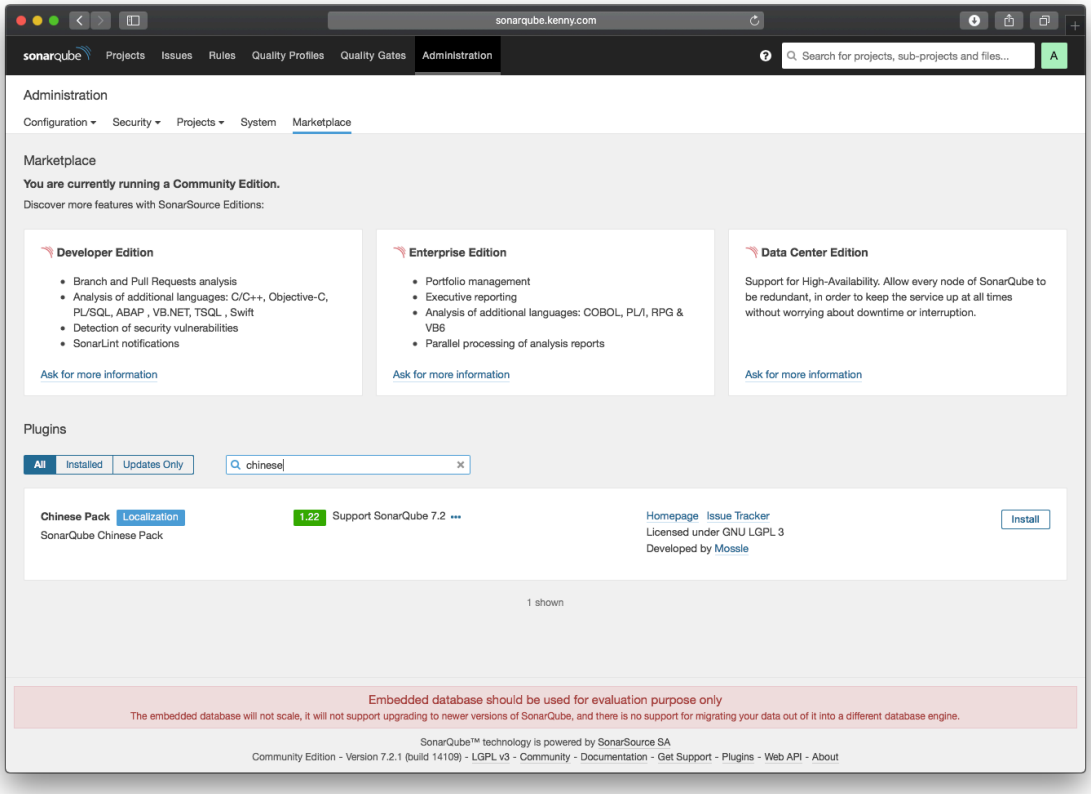


3. 生成 token (作为远程连接 SonarQube 的标识，只生成一次，记得备份哦)

    admin_token: **74439d5bc557dcc206fa8b1f2f5516e65680bdc8**



4. 安装插件 (进入 Administration -> Marketplace)



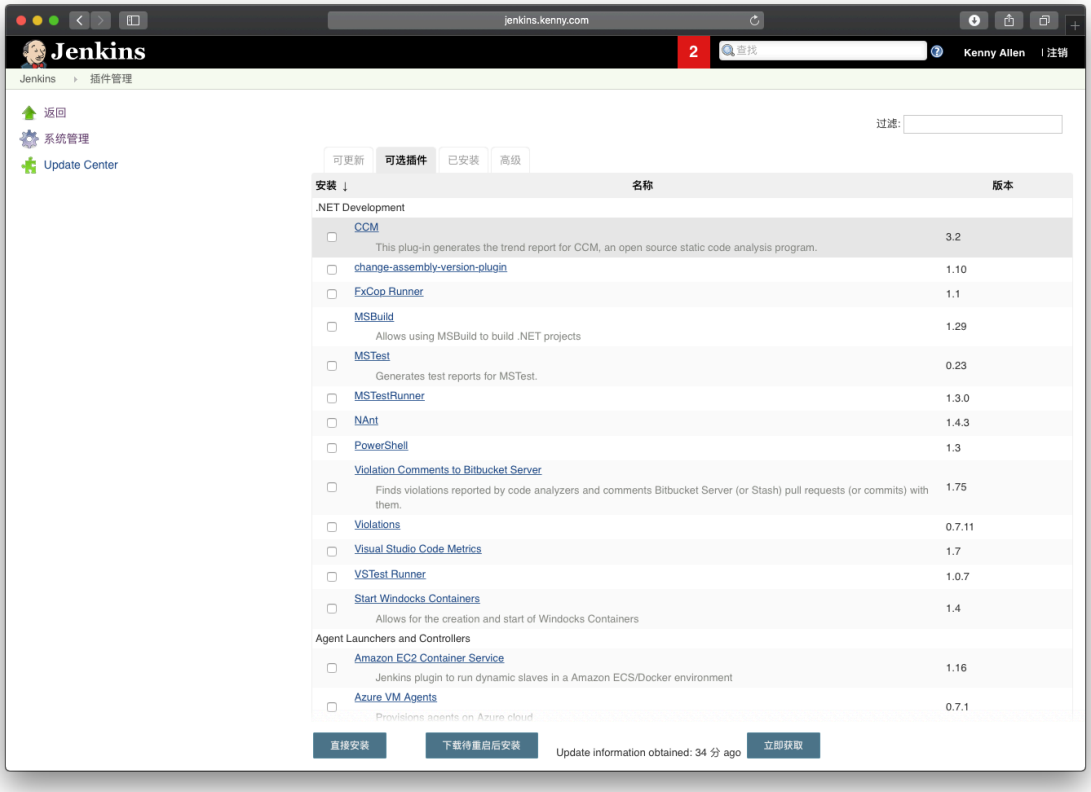
安装完成后点击重启 SonarQube 服务就OK了

集成

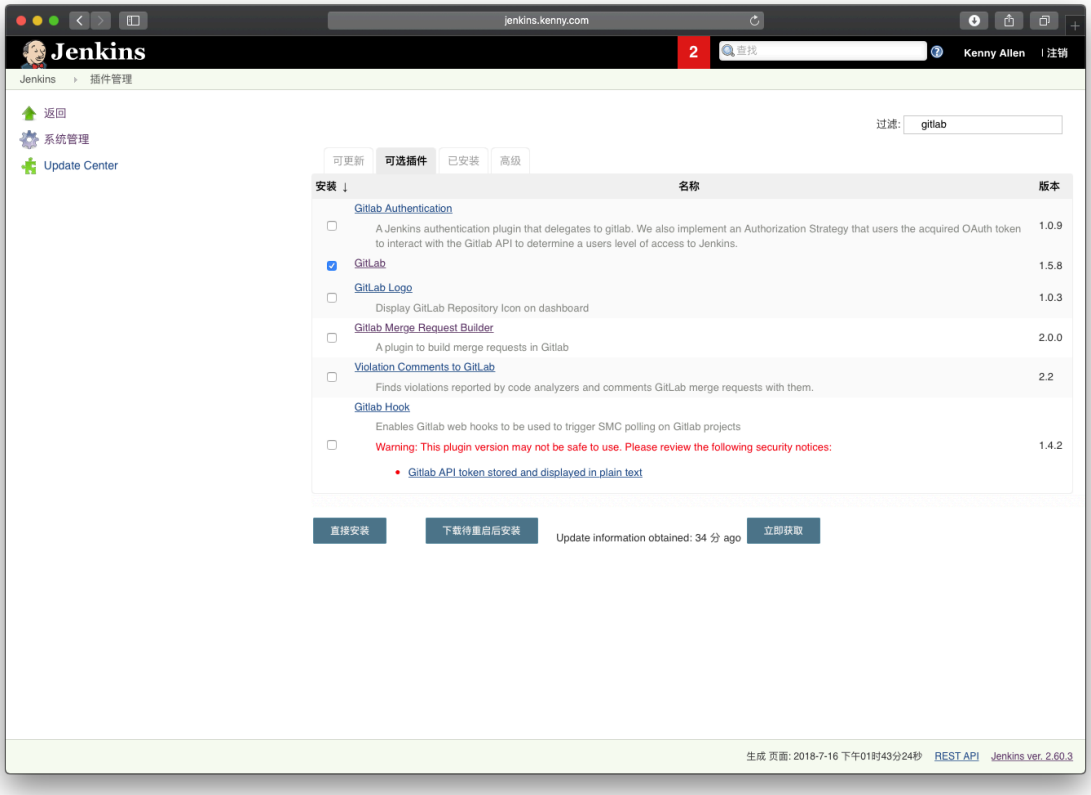
- 将 Jenkins、Gitlab 和 SonarQube 有机整合

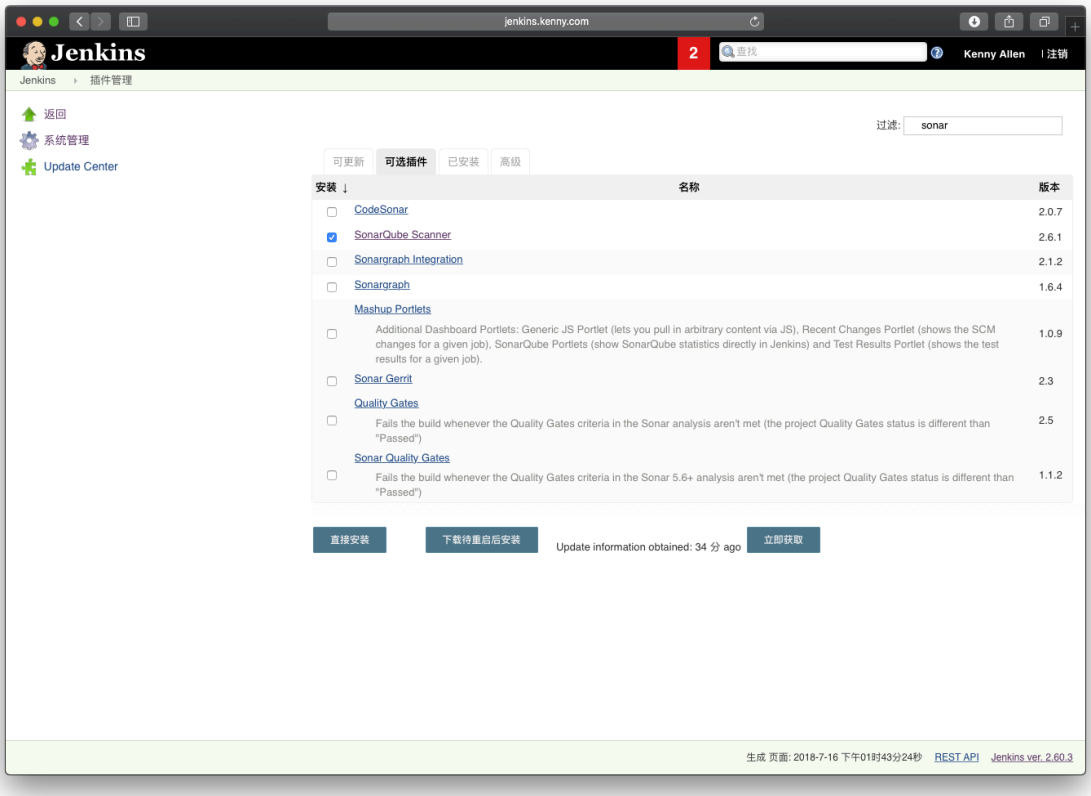
Jenkins 安装插件

1. 点击进入 系统管理 -> 插件管理 -> 可选插件



2. 过滤选中 Gitlab、SonarQube Scanner，点击下载待重启后安装



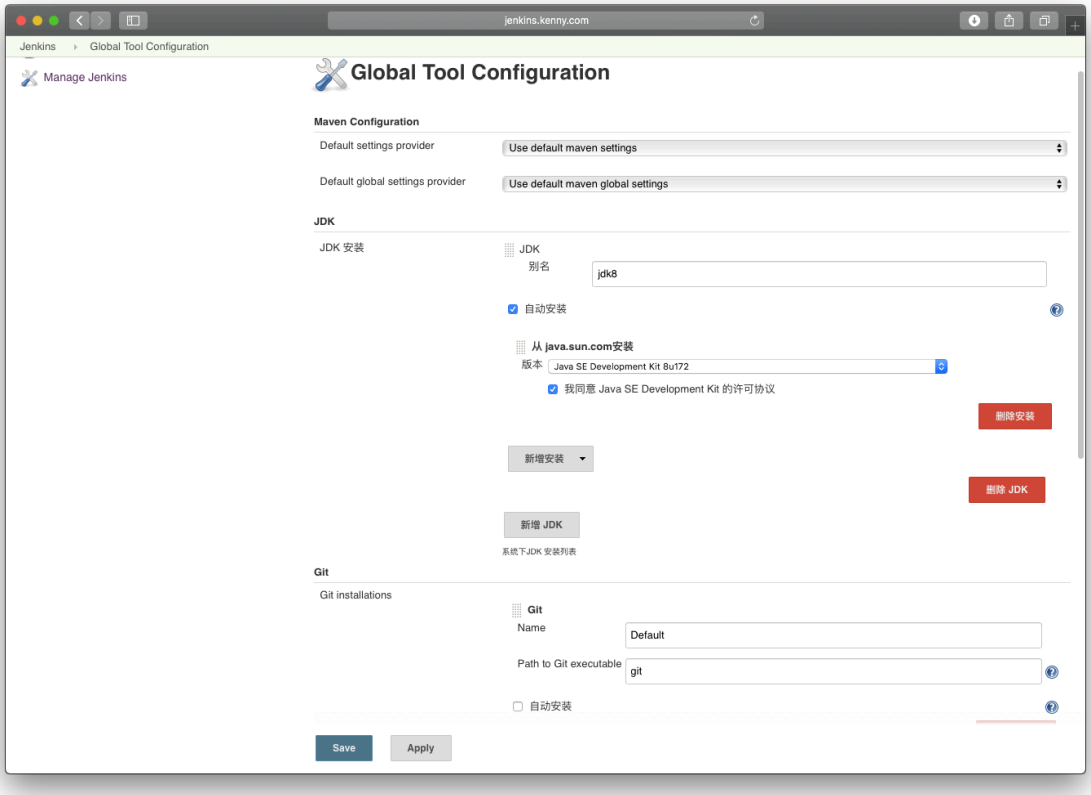


Jenkins 配置

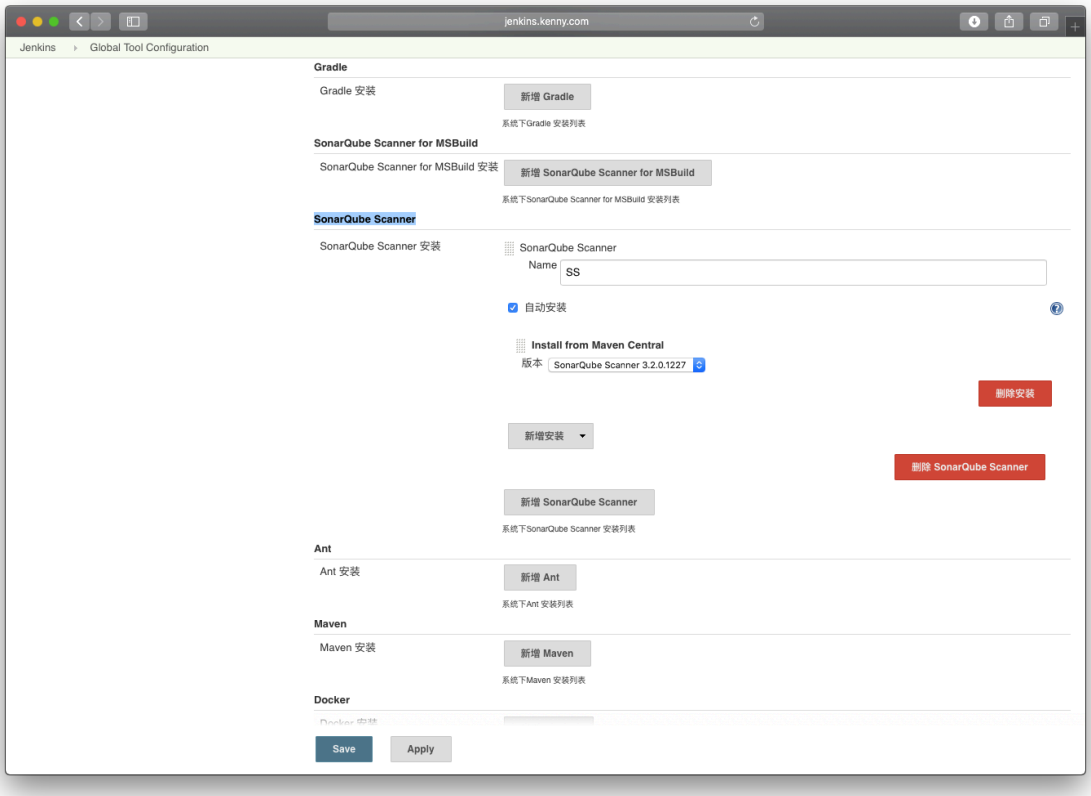
1. 安装 SonarQube & JDK

   进入 系统管理 -> Global Tool Configuration

   JDK 安装



SonarQube Scanner 安装



2. SonarQube Server

   进入 系统管理 -> 系统设置

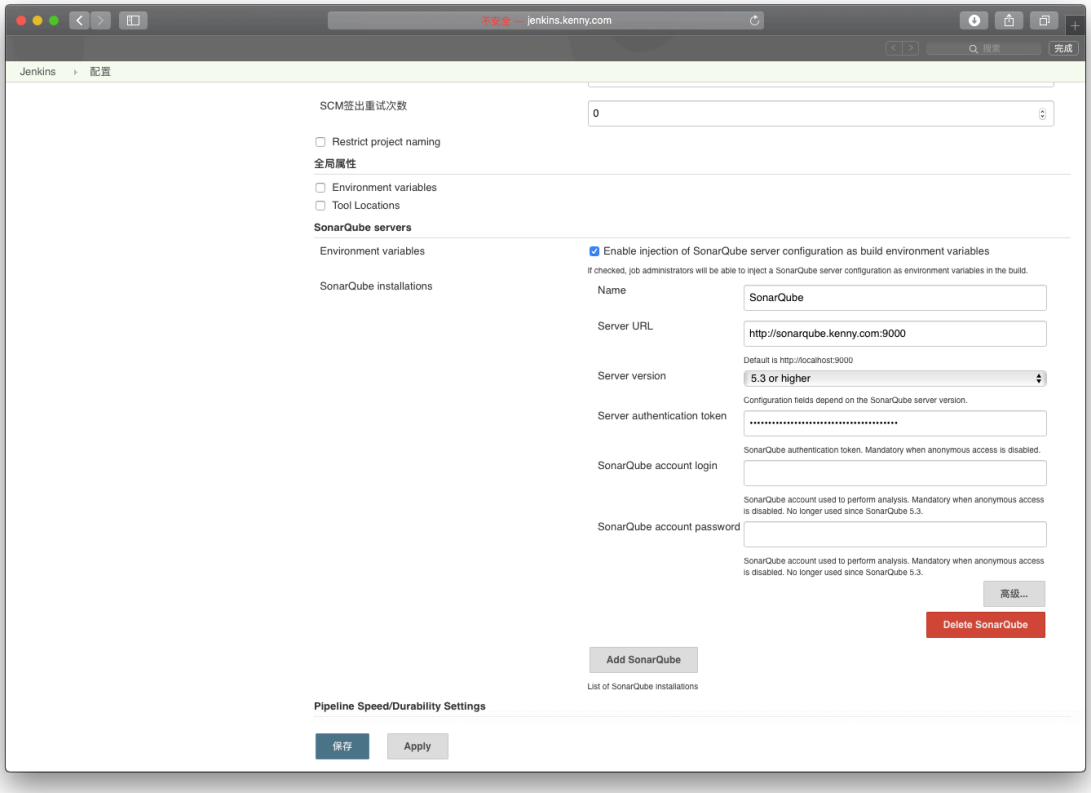
   找到 SonarQube servers

   Name 随便填写

Server URL: http://sonarqube.kenny.com:9000

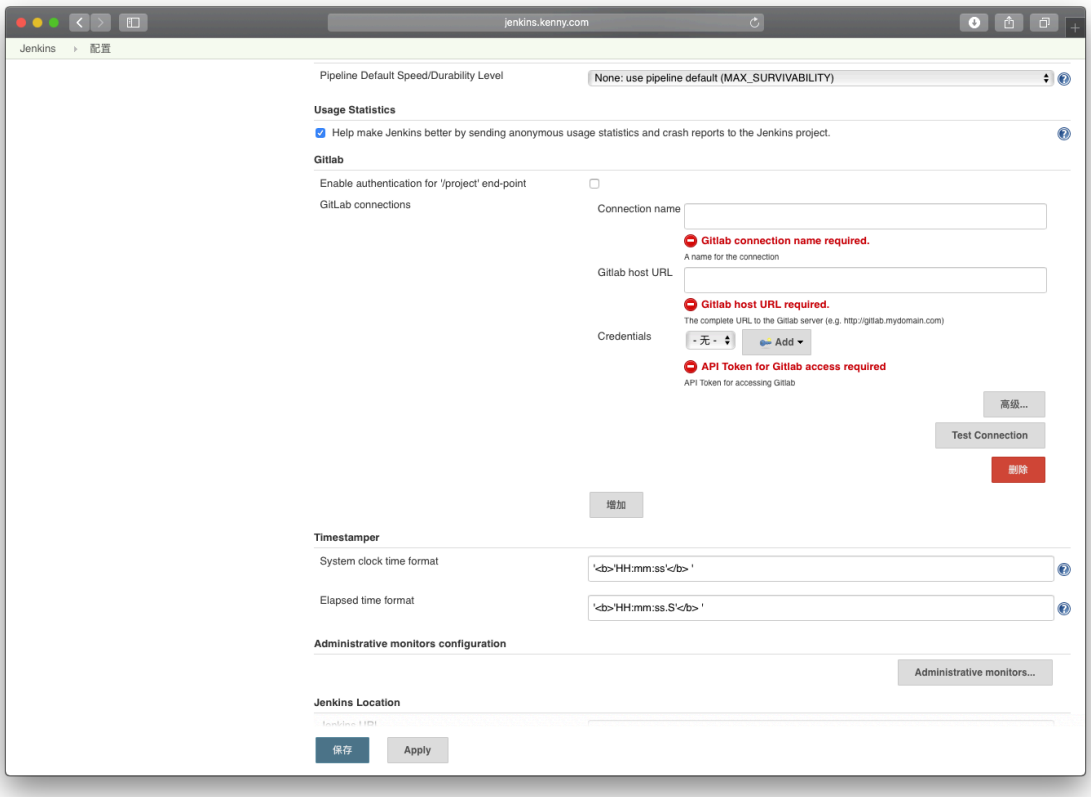
Server version: 5.3 or higher

Server authentication token: 填 SonarQube 初始化时生成的 token



3. 取消 Gitlab 授权

   取消选中 Enable authentication for '/project' end-point，保存



4. 在 jenkins 容器中安装 golang 环境及工具

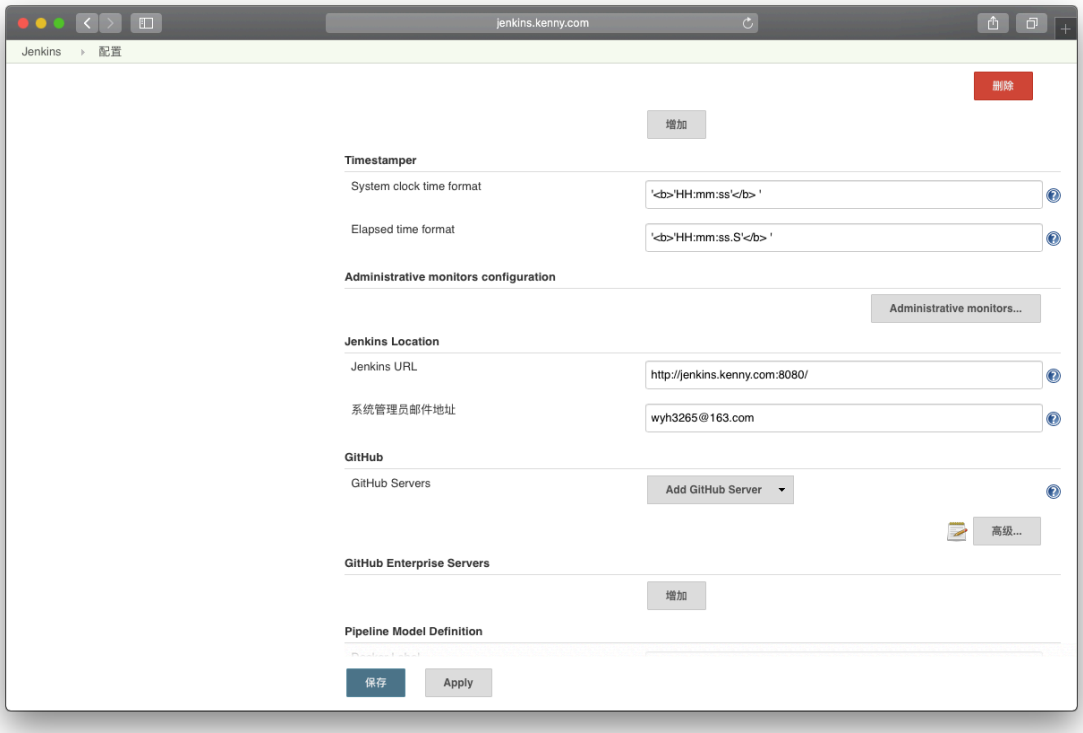
```
# 在 Jenkins 容器中执行命令
docker exec -it jenkins /bin/bash
# 临时设置环境变量
export GOROOT=$JENKINS_HOME/go
export GOPATH=$JENKINS_HOME/workspace/go
export PATH=$PATH:$GOROOT/bin:$GOPATH/bin
export http_proxy=http://192.168.1.100:1087;export
https_proxy=http://192.168.1.100:1087;
# 进入 jenkins 主目录
cd $JENKINS_HOME
# 下载 golang
wget https://dl.google.com/go/go1.10.3.linux-amd64.tar.gz
# 解压 golang 包
tar -xvf  go1.10.3.linux-amd64.tar.gz
# 删除 golang 包
rm go1.10.3.linux-amd64.tar.gz
# 安装必要工具
# vgo
go get -u -v golang.org/x/vgo
# gometalinter
go get -u -v github.com/alecthomas/gometalinter
gometalinter --install
```

5. 配置邮件通知

   进入 系统管理 -> 系统设置

   Jenkins Location

   系统管理员邮件地址修改为你自己的邮箱地址，如 wyh3265@163.com



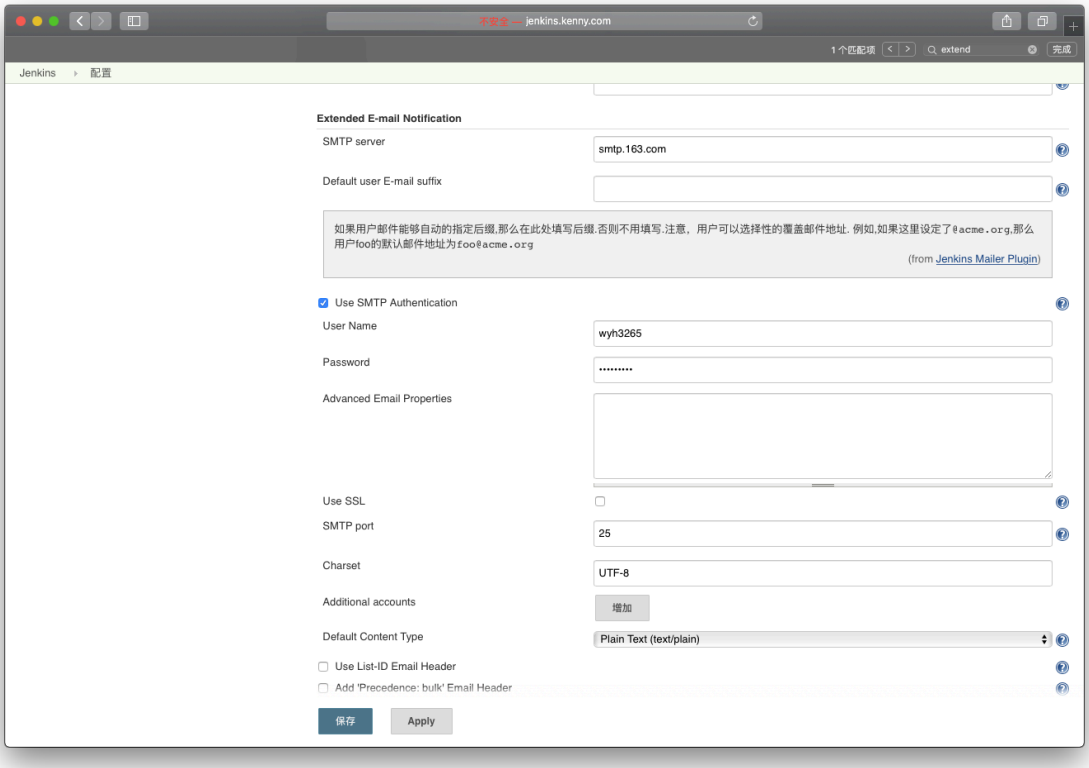
Extend E-mail Notification

SMTP Server 填写对应的SMTP服务地址，如 smtp.163.com

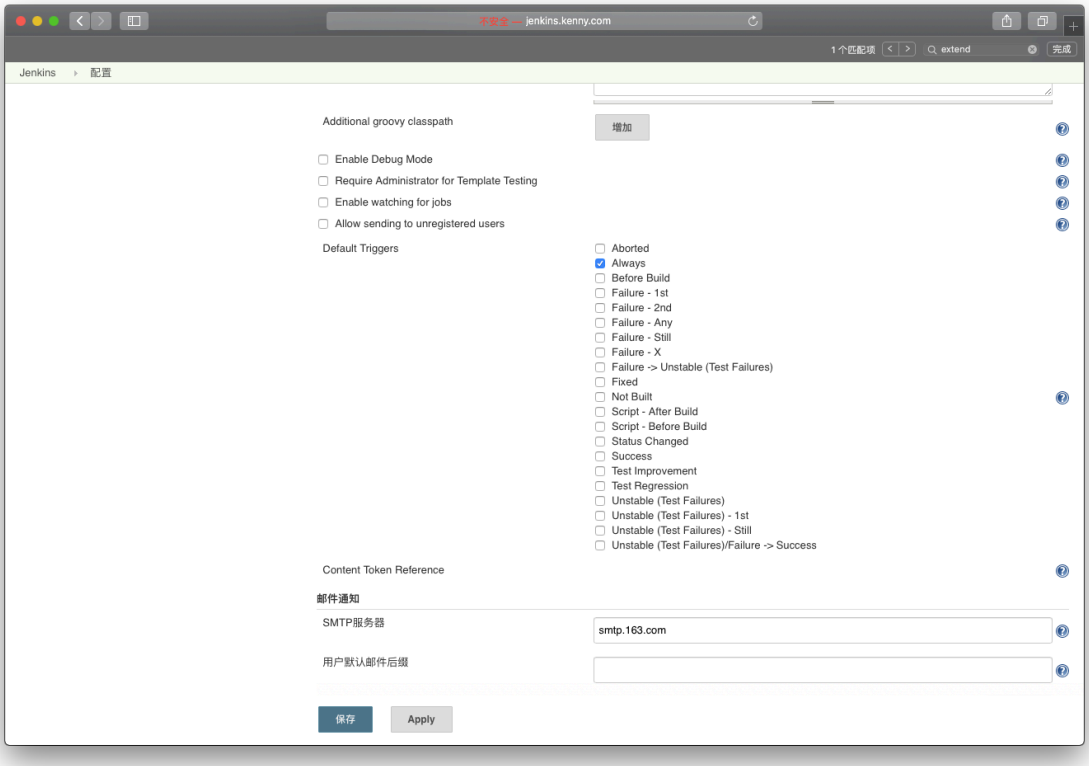
勾选使用SMTP认证

用户名 注意不需要加 @xxx.xxx

密码 填写自己的邮箱密码或授权码

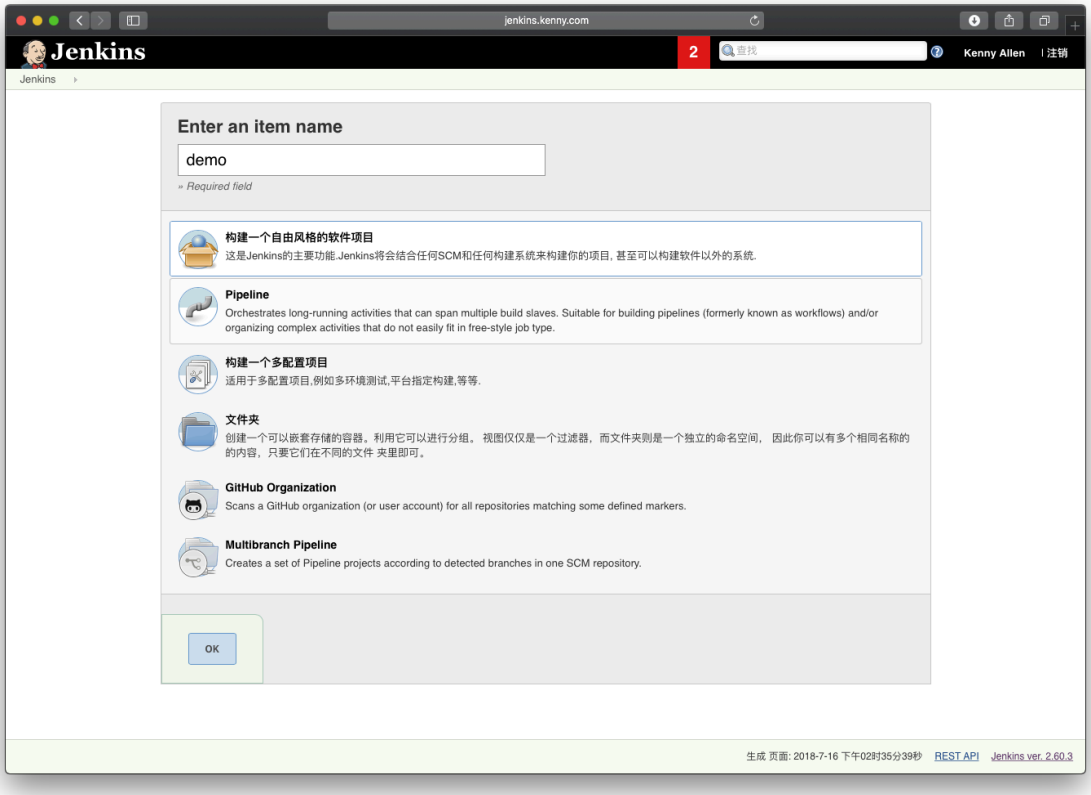


Default Triggers 选中 Always



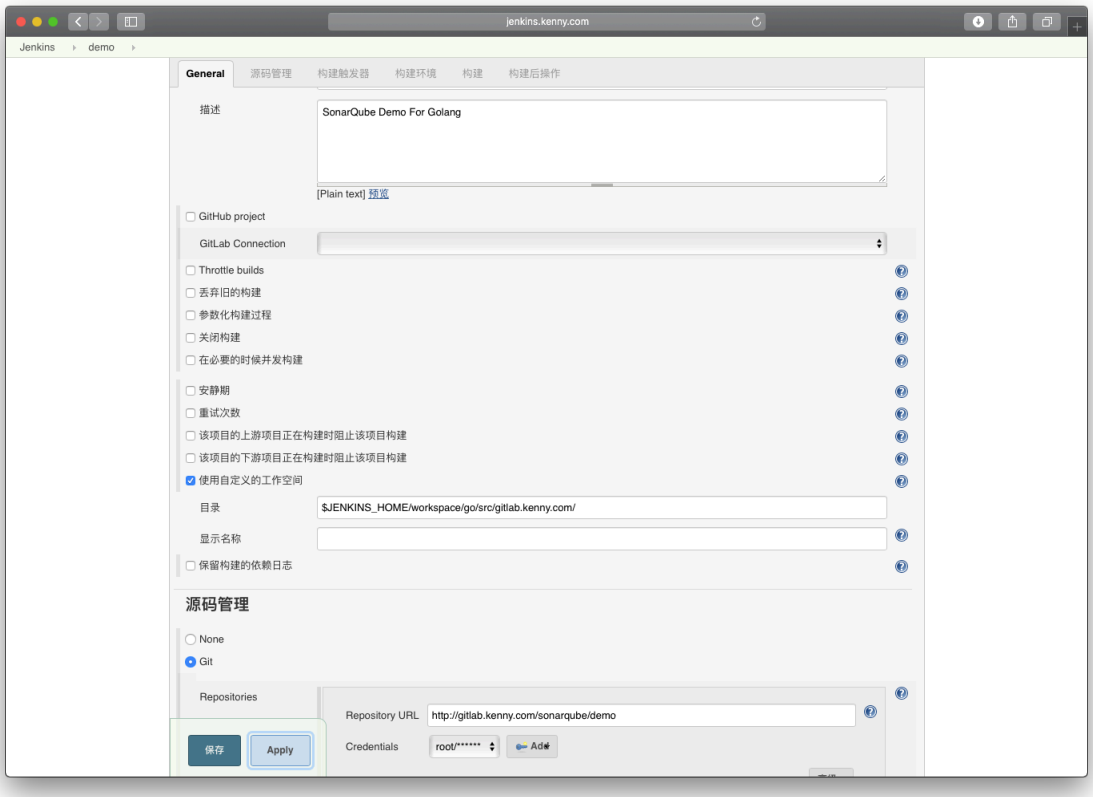
新建 Jenkins 构建任务

1. 新构建一个自由风格的软件项目



2. 使用自定义的工作空间

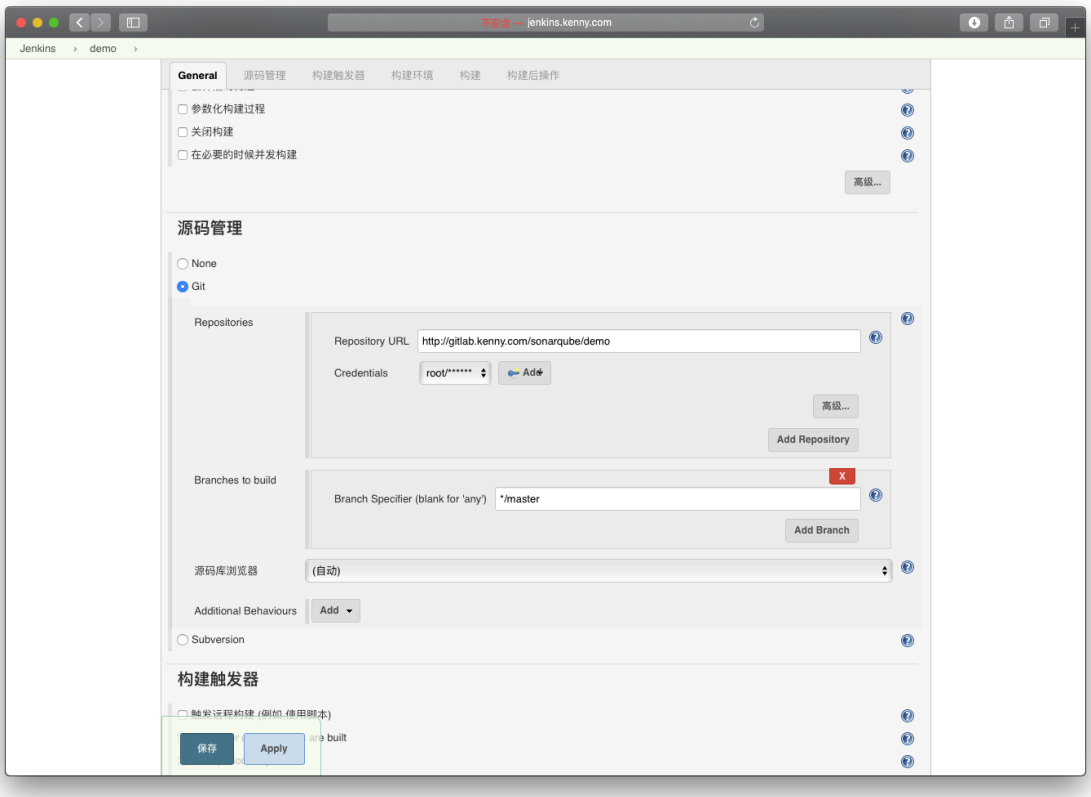
   目录：$JENKINS_HOME/workspace/go/src/gitlab.kenny.com/demo



3. 源码管理

   Repository URL：http://gitlab.kenny.com/sonarqube/demo.git

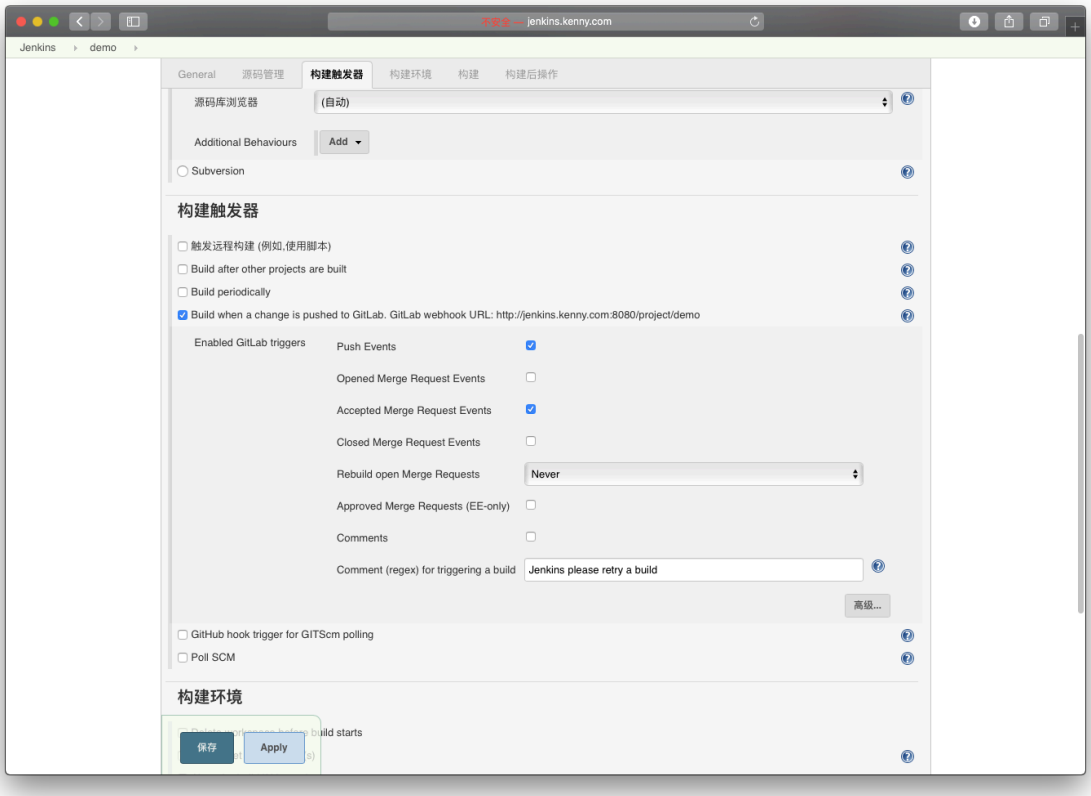
   Credentials：Gitlab 用户名密码或 SSH登录等方式都可以



4. 构建触发器，选中

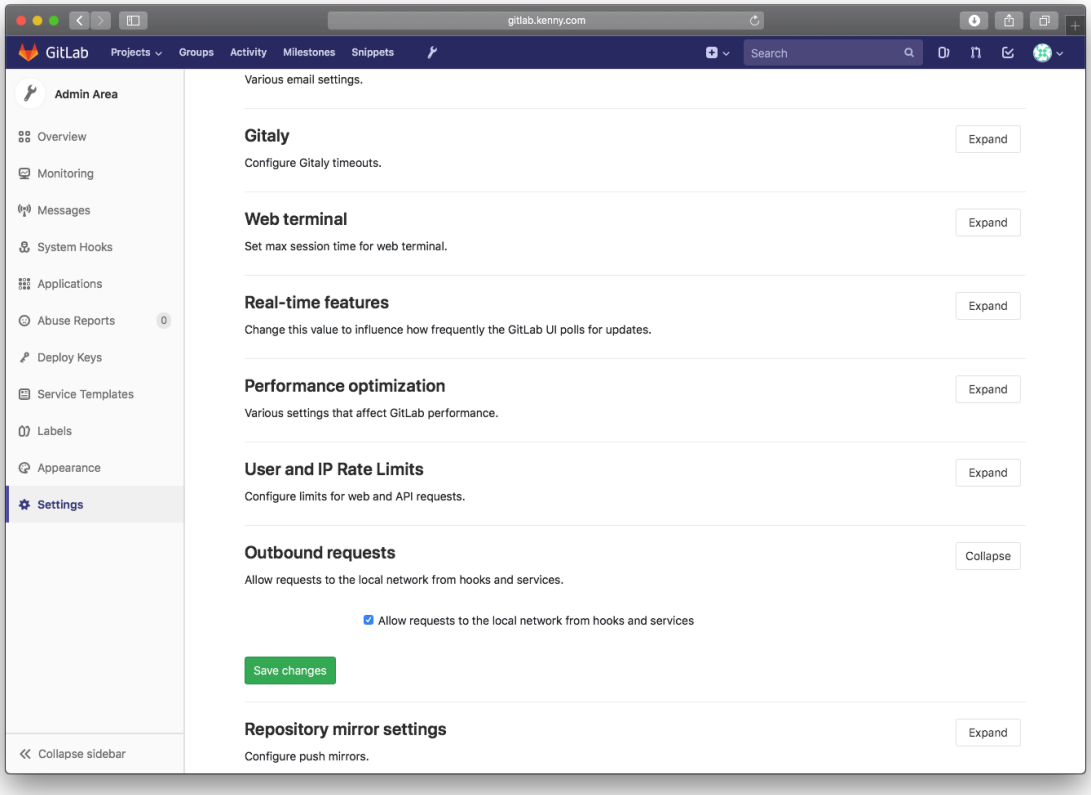
Build when a change is pushed to GitLab. GitLab webhook URL: http://jenkins.kenny.com:8080/project/demo

Enabled GitLab triggers 选中 Push Events 和 Accepted Merge Request Events，表示当 Gitlab 有 push 或 merge 操作发生时触发构建。



5. 新建 webhook

   在浏览器中打开 http://gitlab.kenny.com/admin/application_settings (请使用 root 登录)，找到 Outbound requests，点击 Expand 后，选中 Allow requests to the local network from hooks and services 并保存更改。(允许本地网络的 githook)



进入 http://gitlab.kenny.com/sonarqube/demo/settings/integrations

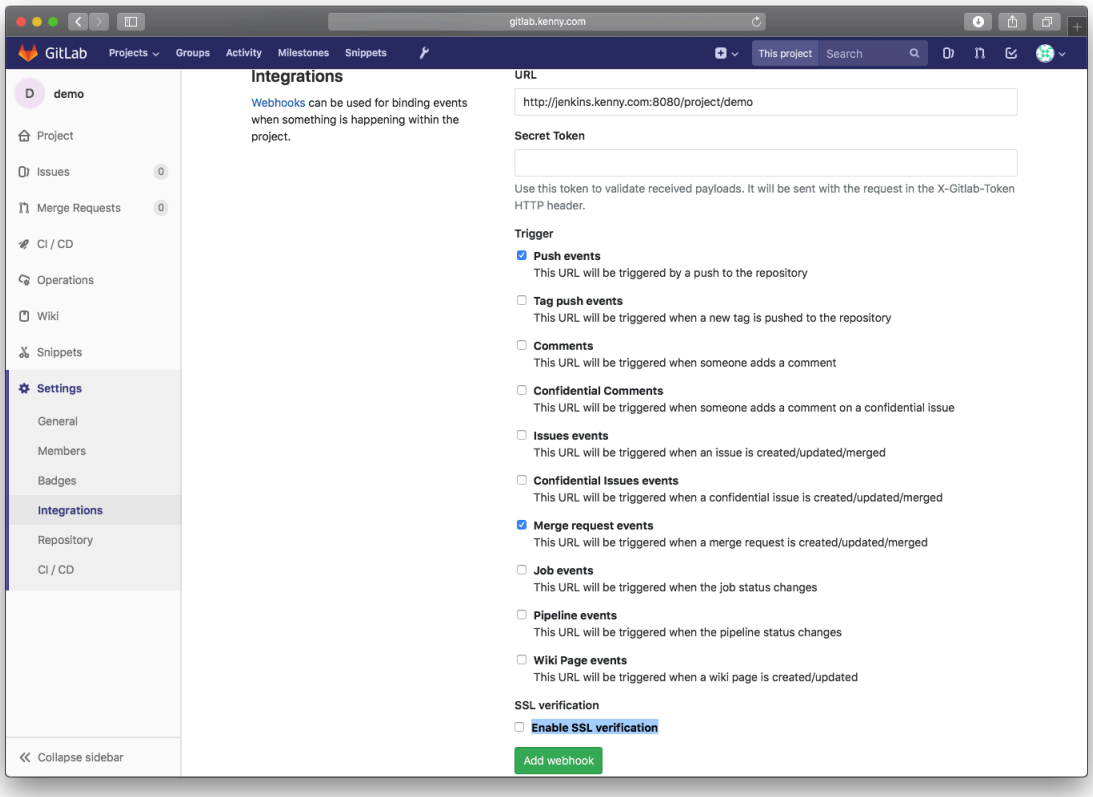
URL: http://jenkins.kenny.com:8080/project/demo

SecretToken: 不填

选中 **Push events**、**Merge request events**

取消选中 **Enable SSL verification**

点击 Add web hook



6. 增加构建步骤，选中 Execute Shell

```
#!/bin/bash
# 环境变量
export GOROOT=$JENKINS_HOME/go
export GOPATH=$JENKINS_HOME/workspace/go
export PATH=$PATH:$GOROOT/bin:$GOPATH/bin
export http_proxy=http://192.168.1.100:1087;export
https_proxy=http://192.168.1.100:1087;

# 安装依赖
vgo mod -vendor

# coverage
go test ./... -coverprofile=coverage.out

# test
go test ./... -json > report.json

# vet
go vet ./... 2> govet-report.out

# golint
golint ./... > golint-report.out

# gometalinter
# 执行 gometalinter 会失败,因此加了 || true
```

```
gometalinter ./... > gometalinter-report.out || true
```

7. 增加构建步骤，选中 Execute SonarQube Scanner

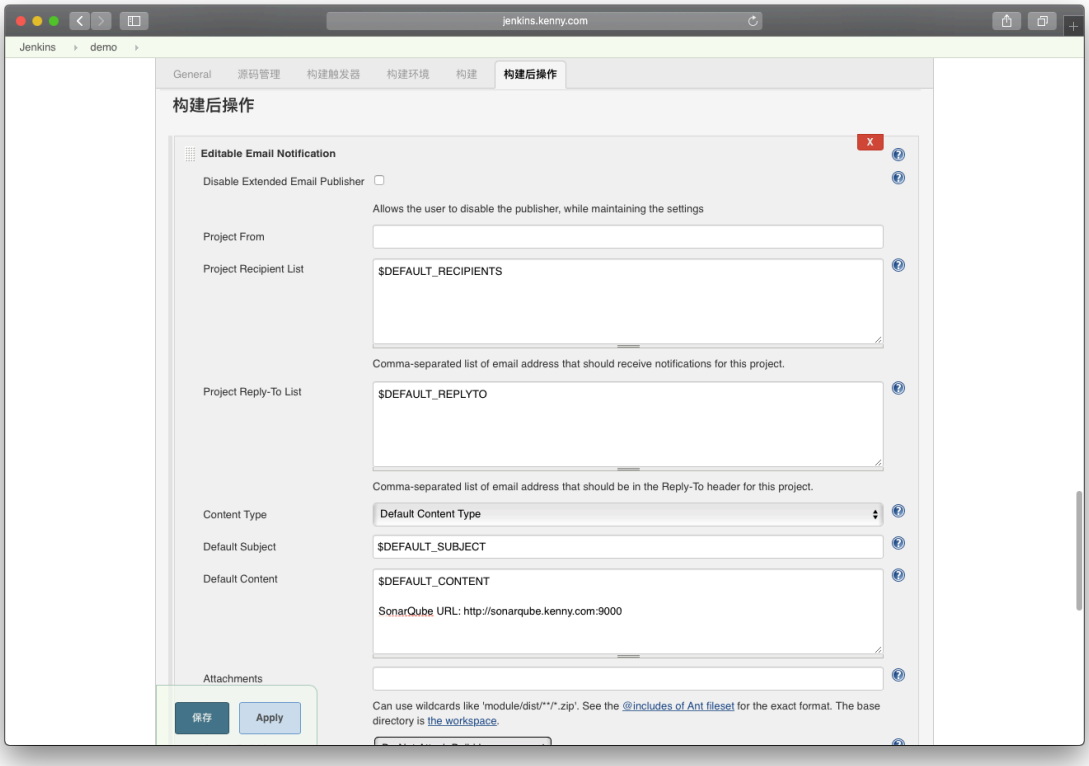
   Analysis properties

```
sonar.projectKey=gitlab.kenny.com
sonar.projectName=demo
sonar.sources=.
sonar.exclusions=**/*_test.go,**/vendor/**
sonar.tests=.
sonar.test.inclusions=**/*_test.go
sonar.test.exclusions=**/vendor/**
sonar.go.coverage.reportPaths=coverage.out
sonar.go.tests.reportPaths=report.json
sonar.go.govet.reportPaths=govet-report.out
sonar.go.golint.reportPaths=golint-report.out
sonar.go.gometalinter.reportPaths=gometalinter-report.out
```

8. 增加构建后操作，选中 Editable Email Notification

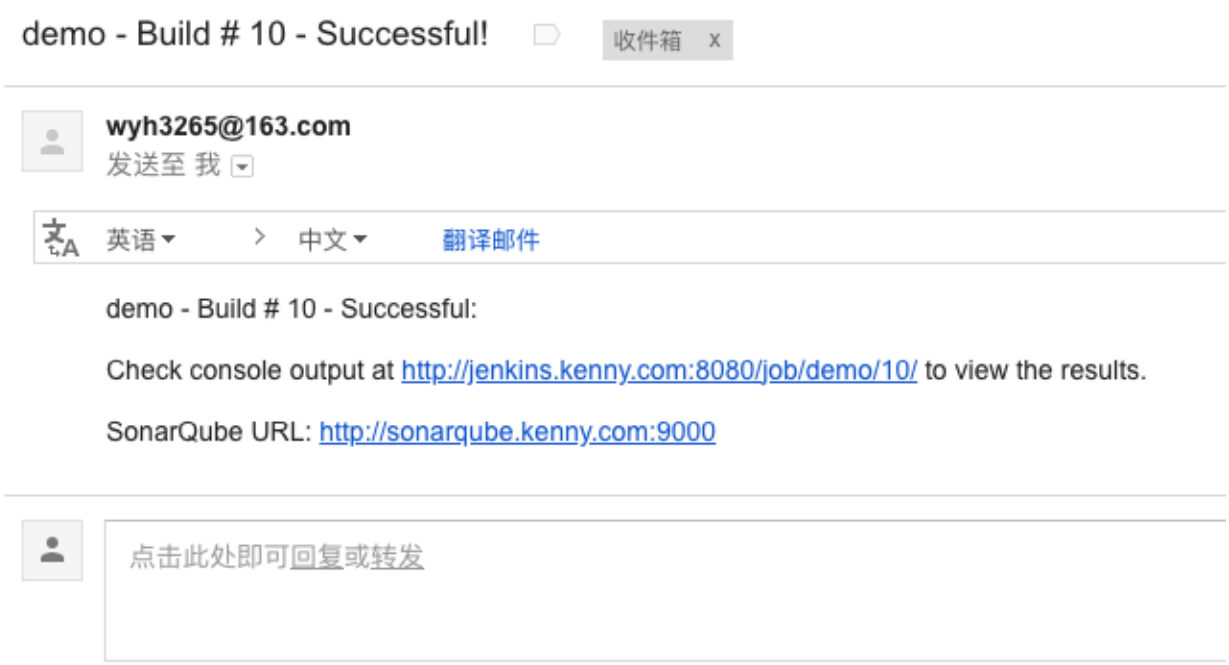
   Project Recipient List 填写接收邮件的Email地址，或使用默认配置

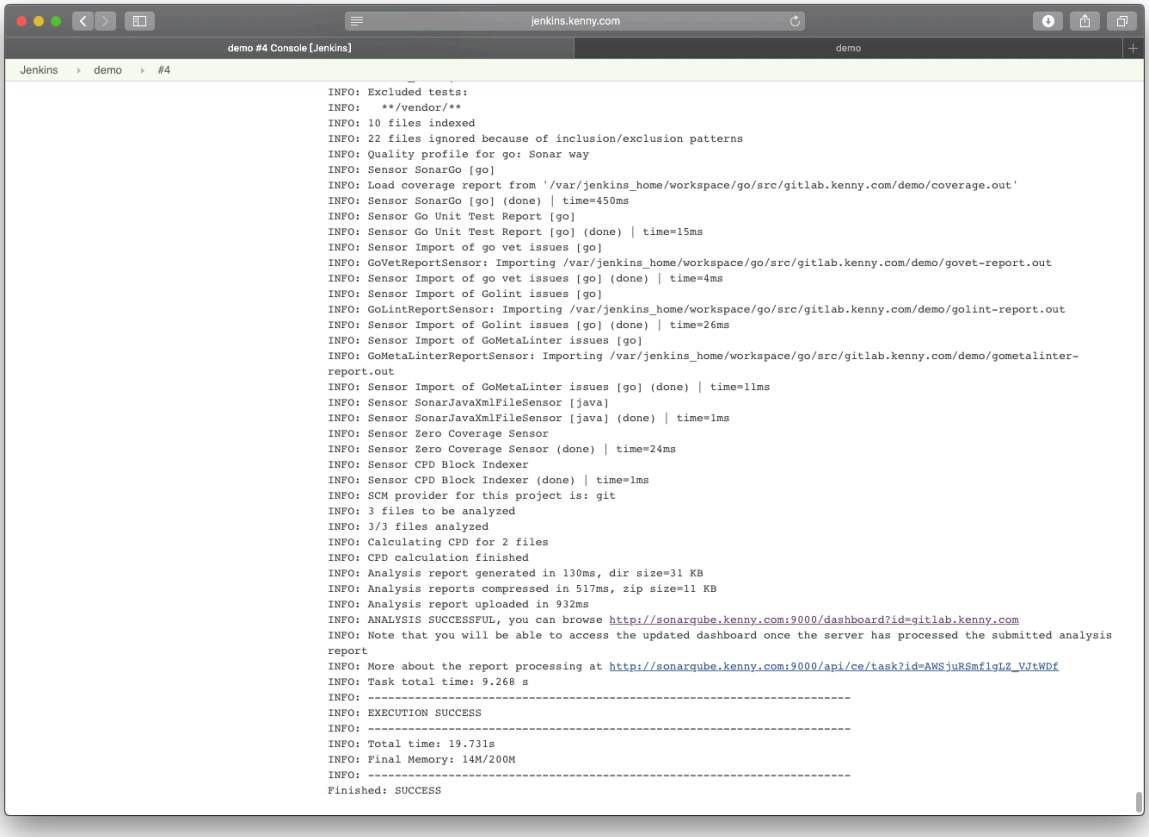
   Default Content 加上 SonarQube URL: http://sonarqube.kenny.com:9000

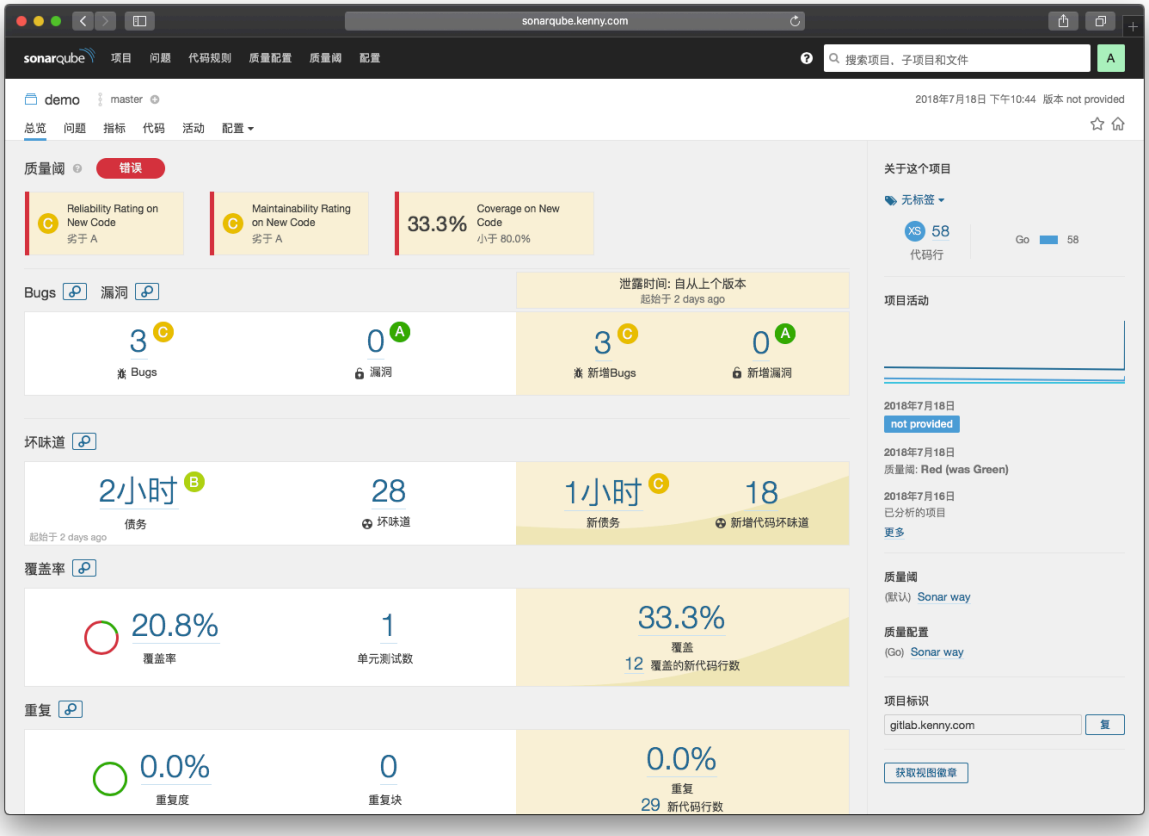


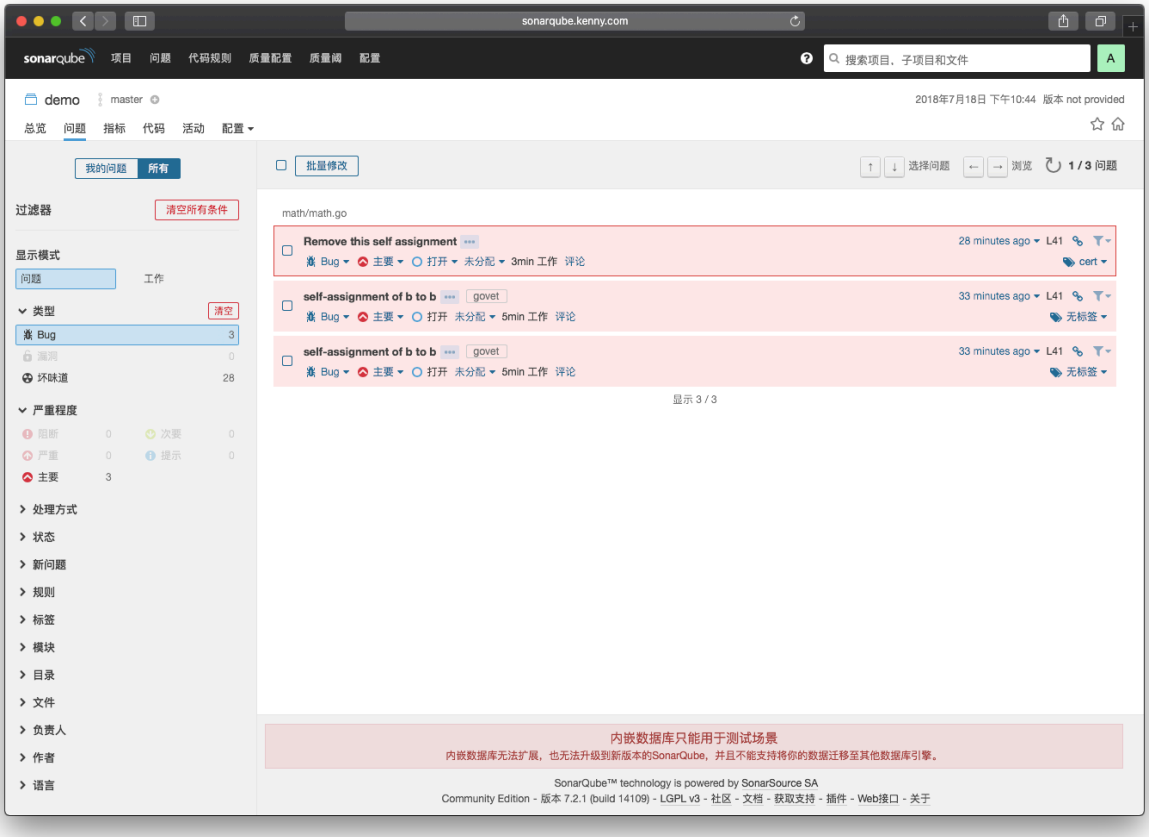
测试

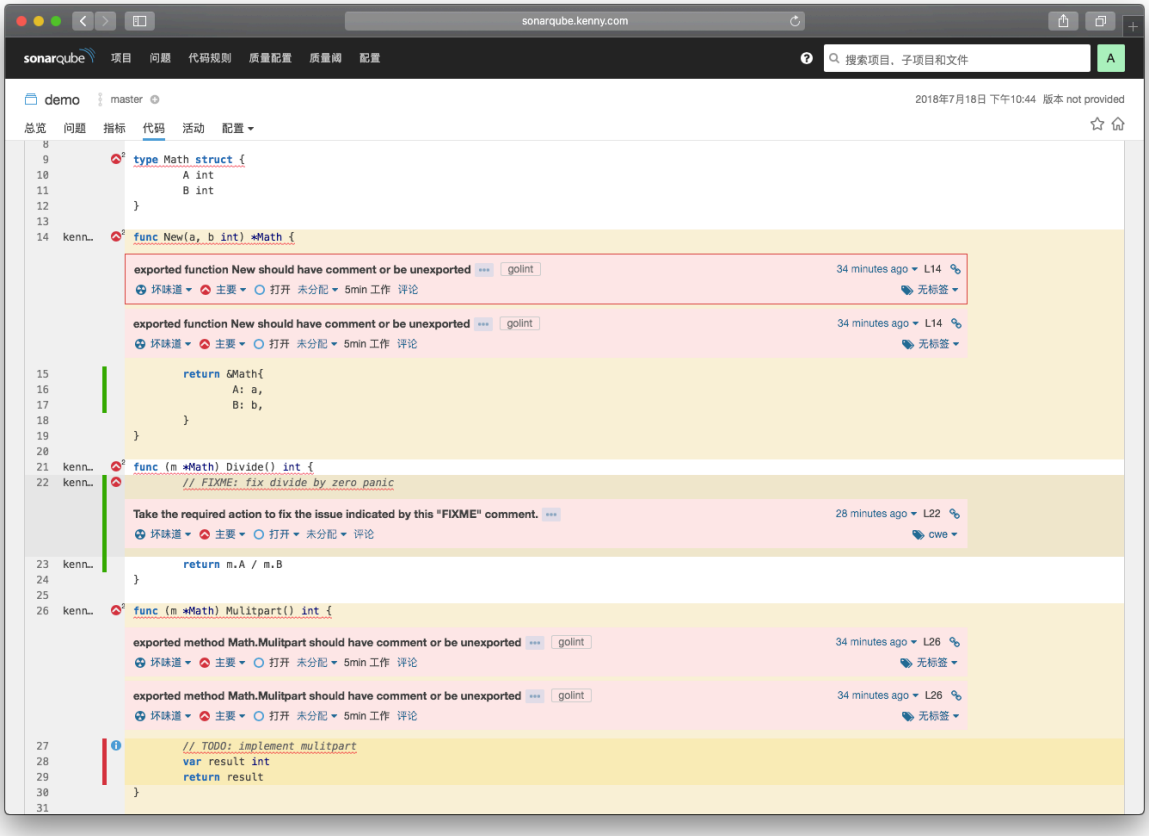
```
# clone demo 代码
cd $GOPATH/src/gitlab.kenny.com && git clone
git@github.com:yuhao5/sonarqube-golang.git && rm -rf demo && mv sonarqube-
golang demo && cd demo
# push 代码，触发 Jenkins 任务进行自动构建
git remote add gitlab git@gitlab.kenny.com:sonarqube/demo.git
git push -u gitlab master

# 若 gitlab 仓库地址不是 git@gitlab.kenny.com:sonarqube/demo.git ，请根据以下步
骤修改：
docker exec -it gitlab /bin/bash
vim /etc/gitlab/gitlab.rb
# 找到 external_url，修改为 external_url 'http://gitlab.kenny.com'
# 然后执行
gitlab-ctl reconfigure
```




jenkins.kenny.com
demo #4 Console [Jenkins]
demo
Jenkins
demo
#4
INFO: Excluded tests:
INFO: **/vendor/**
INFO: 10 files indexed
INFO: 22 files ignored because of inclusion/exclusion patterns
INFO: Quality profile for go: Sonar way
INFO: Sensor SonarGo [go]
INFO: Load coverage report from '/var/jenkins_home/workspace/go/src/gitlab.kenny.com/demo/coverage.out'
INFO: Sensor SonarGo [go] (done) | time=450ms
INFO: Sensor Go Unit Test Report [go]
INFO: Sensor Go Unit Test Report [go] (done) | time=15ms
INFO: Sensor Import of go vet issues [go]
INFO: GoVetReportSensor: Importing /var/jenkins_home/workspace/go/src/gitlab.kenny.com/demo/govet-report.out
INFO: Sensor Import of go vet issues [go] (done) | time=4ms
INFO: Sensor Import of Golint issues [go]
INFO: GoLintReportSensor: Importing /var/jenkins_home/workspace/go/src/gitlab.kenny.com/demo/golint-report.out
INFO: Sensor Import of Golint issues [go] (done) | time=26ms
INFO: Sensor Import of GoMetaLinter issues [go]
INFO: GoMetaLinterReportSensor: Importing /var/jenkins_home/workspace/go/src/gitlab.kenny.com/demo/gometalinter-report.out
INFO: Sensor Import of GoMetaLinter issues [go] (done) | time=11ms
INFO: Sensor SonarJavaXmlFileSensor [java]
INFO: Sensor SonarJavaXmlFileSensor [java] (done) | time=1ms
INFO: Sensor Zero Coverage Sensor
INFO: Sensor Zero Coverage Sensor (done) | time=24ms
INFO: Sensor CPD Block Indexer
INFO: Sensor CPD Block Indexer (done) | time=1ms
INFO: SCM provider for this project is: git
INFO: 3 files to be analyzed
INFO: 3/3 files analyzed
INFO: Calculating CPD for 2 files
INFO: CPD calculation finished
INFO: Analysis report generated in 130ms, dir size=31 KB
INFO: Analysis reports compressed in 517ms, zip size=11 KB
INFO: Analysis report uploaded in 932ms
INFO: ANALYSIS SUCCESSFUL, you can browse http://sonarqube.kenny.com:9000/dashboard?id=gitlab.kenny.com
INFO: Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report
INFO: More about the report processing at http://sonarqube.kenny.com:9000/api/ce/task?id=AWSjuRSmf1gLZ_VJtWDf
INFO: Task total time: 9.268 s
INFO: --
INFO: EXECUTION SUCCESS
INFO: --
INFO: Total time: 19.731s
INFO: Final Memory: 14M/200M
INFO: --
Finished: SUCCESS


sonarqube.kenny.com
sonarqube
项目
问题
代码规则
质量配置
质量阈
配置
搜索项目、子项目和文件
A
demo
master
2018年7月18日 下午10:44 版本 not provided
总览
问题
指标
代码
活动
配置
质量阈
错误
Reliability Rating on New Code
劣于 A
Maintainability Rating on New Code
劣于 A
33.3%
Coverage on New Code
小于 80.0%
Bugs
漏洞
泄露时间: 自从上个版本
起始于 2 days ago
3
Bugs
0
漏洞
3
新增Bugs
0
新增漏洞
坏味道
2小时
债务
起始于 2 days ago
28
坏味道
1小时
新债务
18
新增代码坏味道
覆盖率
20.8%
覆盖率
1
单元测试数
33.3%
覆盖
12 覆盖的新代码行数
重复
0.0%
重复度
0
重复块
0.0%
重复
29 新代码行数
关于这个项目
无标签
XS 58
代码行
Go 58
项目活动
2018年7月18日
not provided
2018年7月18日
质量阈: Red (was Green)
2018年7月16日
已分析的项目
更多
质量阈
(默认) Sonar way
质量配置
(Go) Sonar way
项目标识
gitlab.kenny.com
复
获取视图徽章





TODO

1. 解决执行 gometalinter 失败问题

2. Golang 质量标准，规则自定义
3. ...