第1章 CI/CD介绍

1.什么是持续集成/持续部署

```
持续集成(Continuous integration)是一种软件开发实践，即团队开发成员经常集成它们的工作，通过每个成员 每天至少集成一次，也就意味着每天可能会发生多次集成。每次集成都通过自动化的构建(包括编译，发布，自动 化测试)来验证，从而尽早地发现集成错误。

持续部署(continuous deployment)是通过自动化的构建、测试和部署循环来快速交付高质量的产品。某种程度 上代表了一个开发团队工程化的程度，毕竟快速运转的互联网公司人力成本会高于机器，投资机器优化开发流程化 相对也提高了人的效率。

持续交付 Continuous Delivery:频繁地将软件的新版本，交付给质量团队或者用户，以供评审尽早发现生产环境 中存在的问题;如果评审通过，代码就进入生产阶段
```

第2章 Jenkins pipeline

1.什么是pipeline

```
简单来说，就是将多个任务连接起来，组成流水线
```

2.pipeline概念

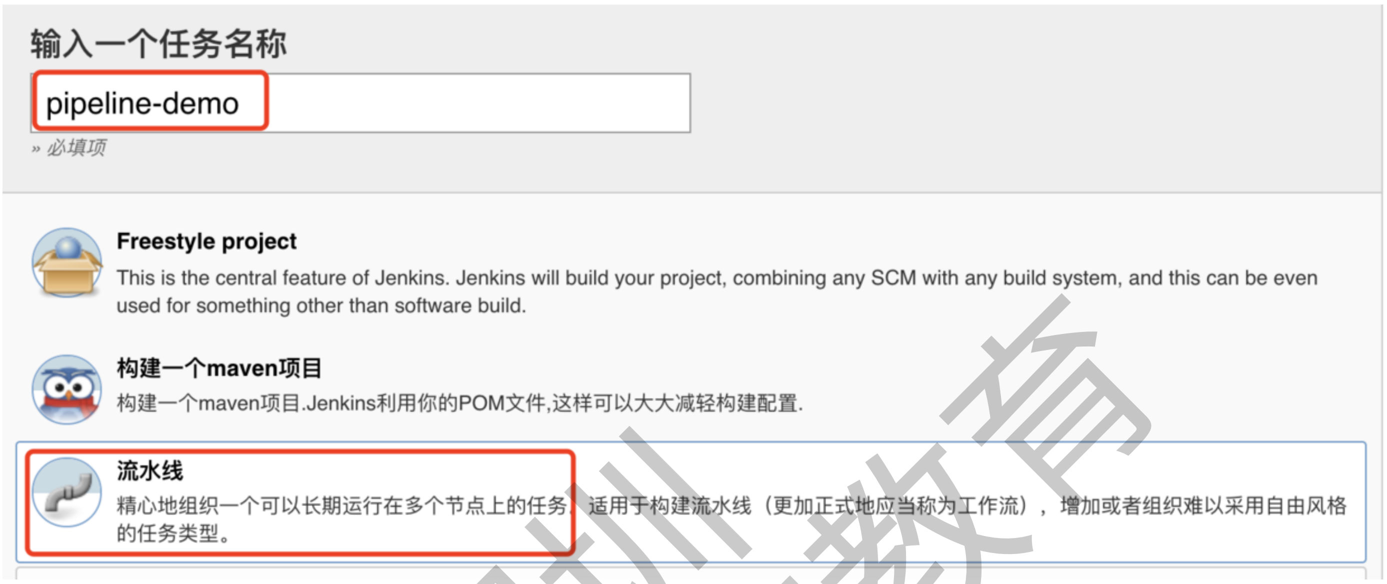
```
Agent 节点
Stage 阶段
Steps 动作
```

3.Jenkins语法介绍

```
pipeline {                                        #所有代码都在pipeline{}内
    agent any                                     #agent{}定义任务运行在哪台主机上，可以是any,node等
    environment {                                 #定义环境变量，变量名称=变量值，比如PATH路径等
        host='oldya.com'
    }
    stages {                                      #一个项目的集合，主要用来包含所有stage子项目
        stage('code'){                            #一个项目中的单个任务，主要用来包含step
            steps {                               #steps主要用来实现具体执行的动作
                echo "code for host $host"
            }
        }
    }
    stage('build'){
        steps {
            sh "echo $host"
        }
    }
}
```

第3章 体验pipeline项目

1.创建流水线项目


输入一个任务名称

pipeline-demo

» 必填项

Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

构建一个maven项目

构建一个maven项目.Jenkins利用你的POM文件,这样可以大大减轻构建配置.

流水线

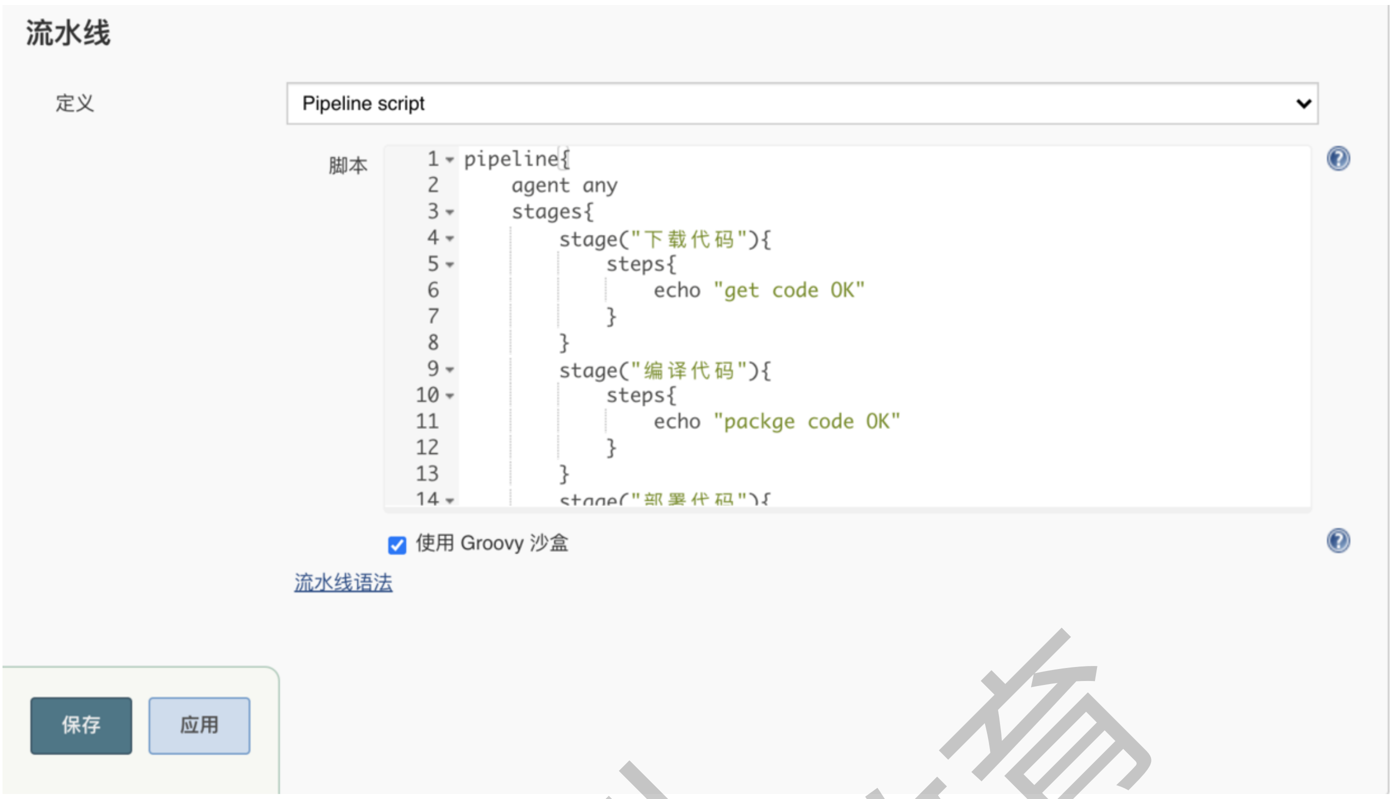
精心地组织一个可以长期运行在多个节点上的任务。适用于构建流水线（更加正式地应当称为工作流），增加或者组织难以采用自由风格的任务类型。

2.填写代码

代码如下：

```
pipeline{
    agent any
    stages{
        stage("下载代码"){
            steps{
                echo "get code OK"
            }
        }
        stage("编译代码"){
            steps{
                echo "packge code OK"
            }
        }
        stage("部署代码"){
            steps{
                echo "deploy code OK"
            }
        }
    }
}
```

执行效果：



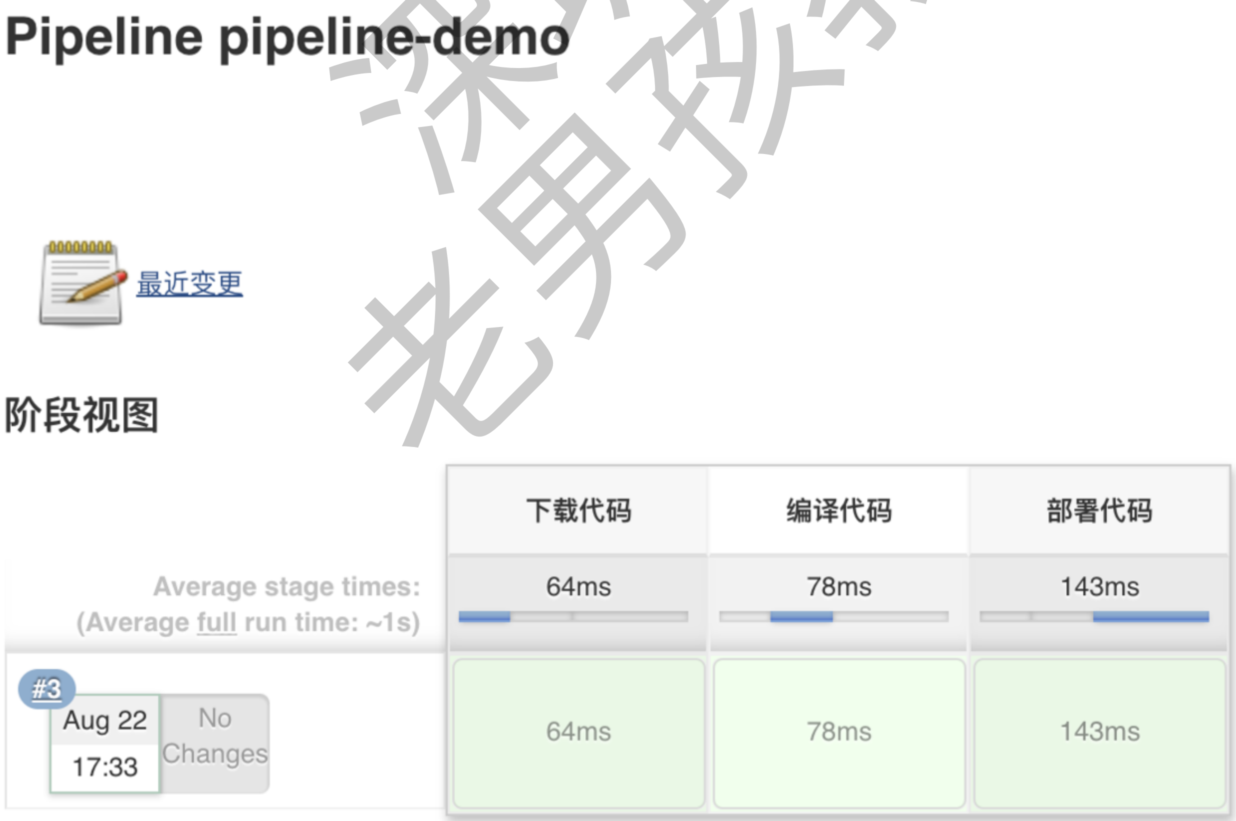
定义 Pipeline script

脚本

```
pipeline{
    agent any
    stages{
        stage("下载代码"){
            steps{
                echo "get code OK"
            }
        }
        stage("编译代码"){
            steps{
                echo "packge code OK"
            }
        }
        stage("部署代码"){
```

使用 Groovy 沙盒

3.执行效果

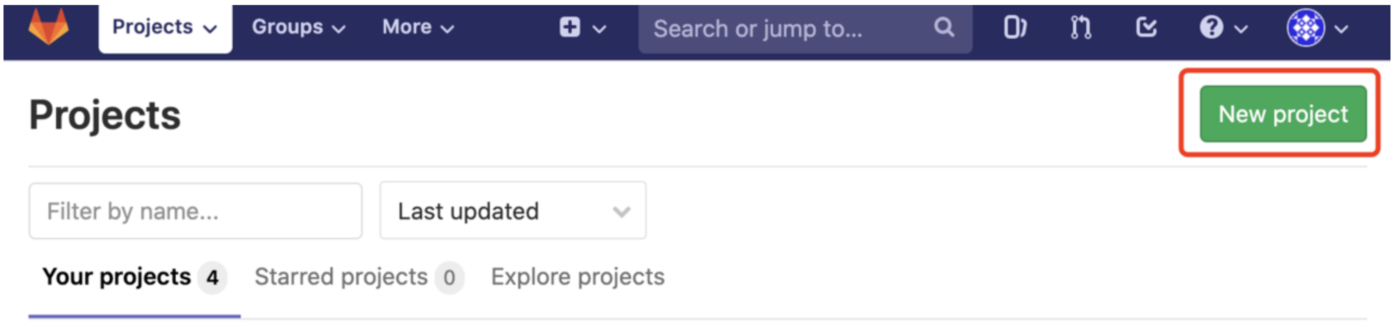


	下载代码	编译代码	部署代码
Average stage times: (Average full run time: ~1s)	64ms	78ms	143ms
#3 Aug 22 17:33 No Changes	64ms	78ms	143ms

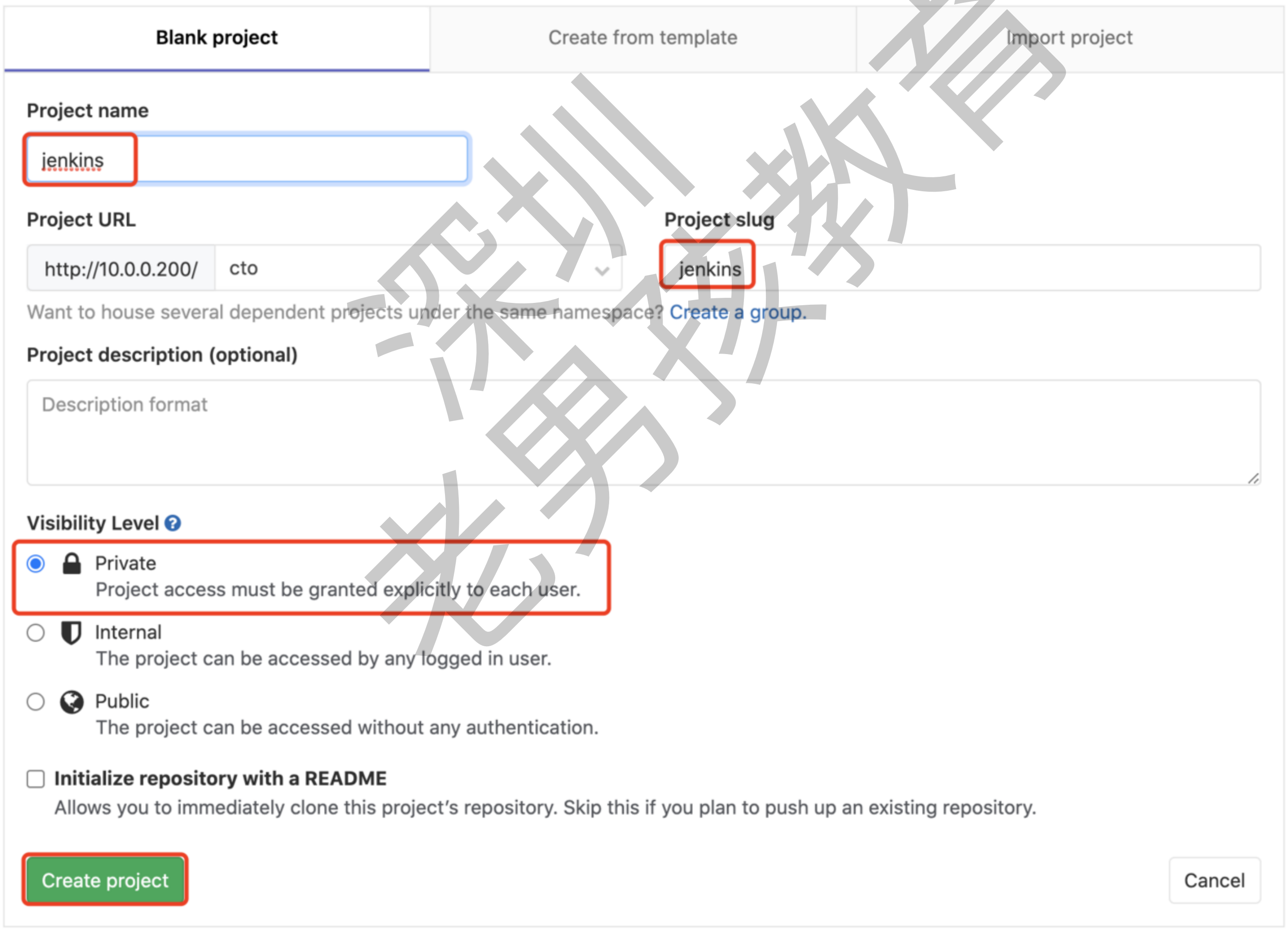
第4章 SCM形式执行pipeline代码

除了在流水线项目里直接配置pipeline代码外，我们还可以将pipeline代码保存成文件存放在代码仓库里，然后配置jenkins直接从代码仓库拉取pipeline file并执行流水线作业.下面我们演示一下。

1.在gitlab上创建新项目



2.填写项目信息



Project name: jenkins

Project URL: http://10.0.0.200/ cto

Project slug: jenkins

Want to house several dependent projects under the same namespace? Create a group.

Project description (optional)

Description format

Visibility Level

Private: Project access must be granted explicitly to each user. (selected)

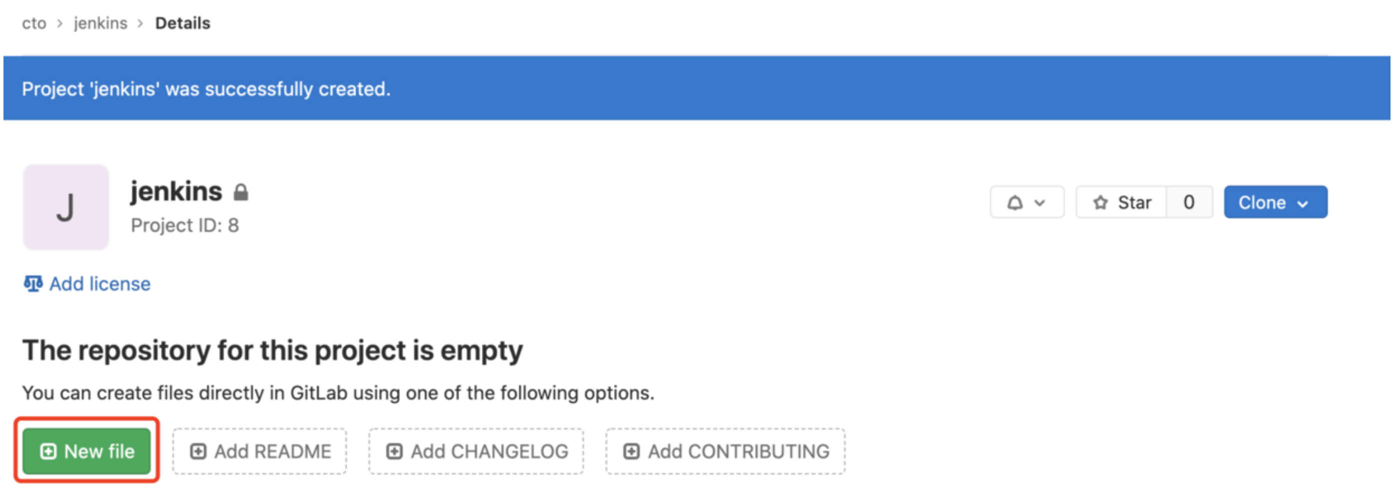
Internal: The project can be accessed by any logged in user.

Public: The project can be accessed without any authentication.

Initialize repository with a README

Allows you to immediately clone this project's repository. Skip this if you plan to push up an existing repository.

3.编写Jenkins file


cto › jenkins › Details

Project 'jenkins' was successfully created.

jenkins

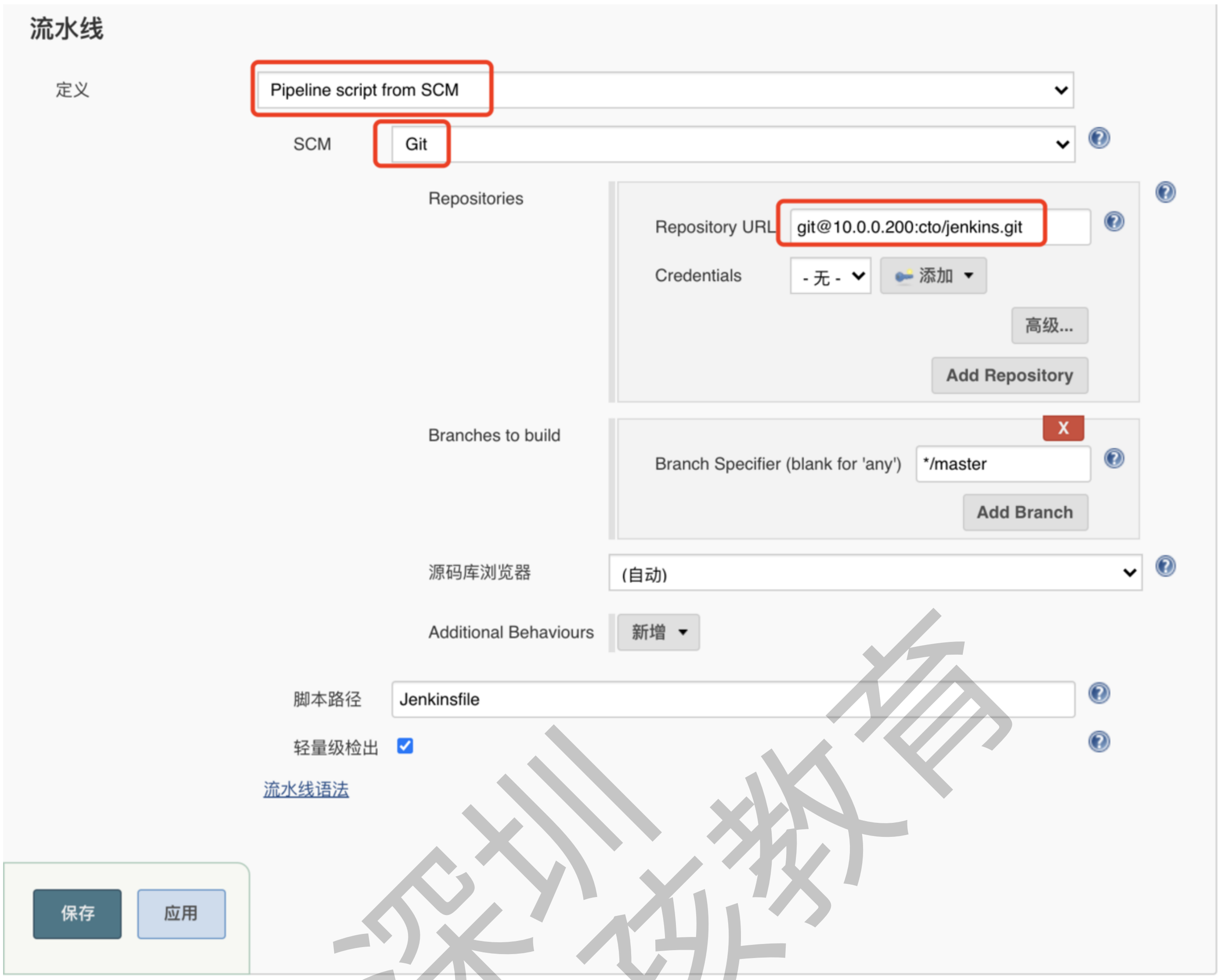
Project ID: 8

The repository for this project is empty

You can create files directly in GitLab using one of the following options.

4.配置部署密钥

5.jenkins配置pipeline从gitlab拉取



流水线

定义 Pipeline script from SCM

SCM Git

Repositories

Repository URL git@10.0.0.200:cto/jenkins.git

Credentials - 无 -

Branches to build

Branch Specifier (blank for 'any') */master

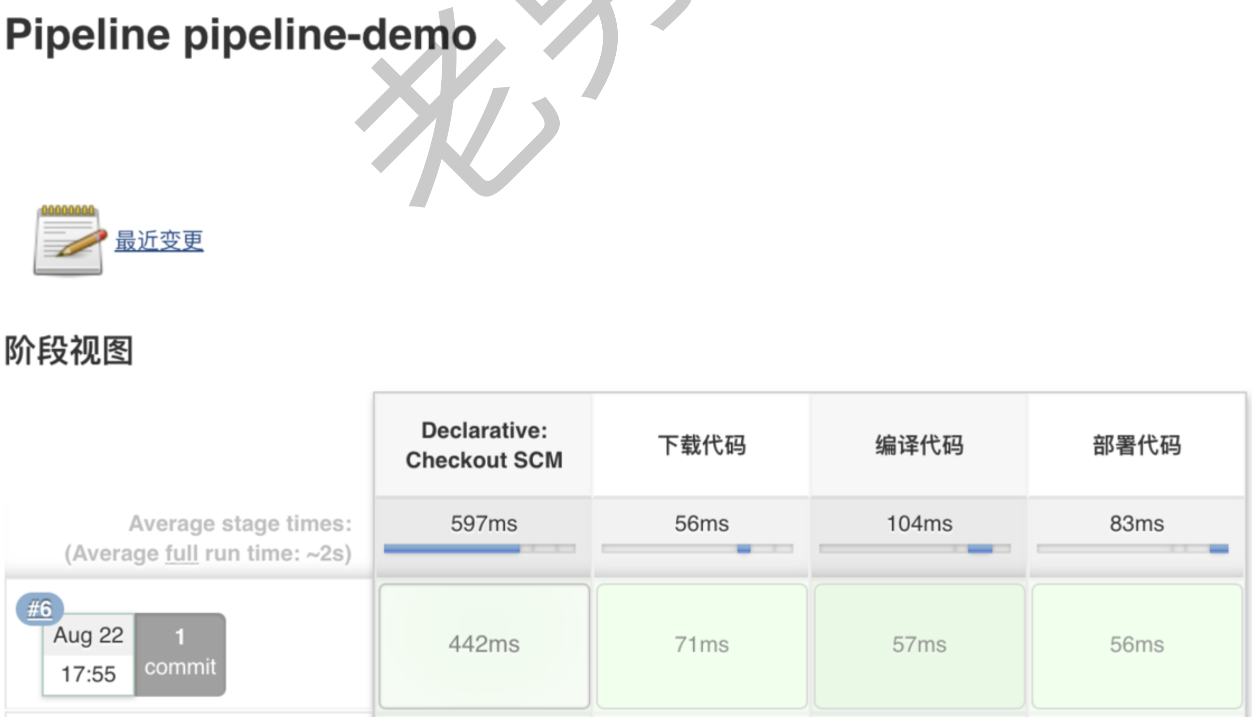
源码库浏览器 (自动)

Additional Behaviours

脚本路径 Jenkinsfile

轻量级检出 ✓

6.构建测试



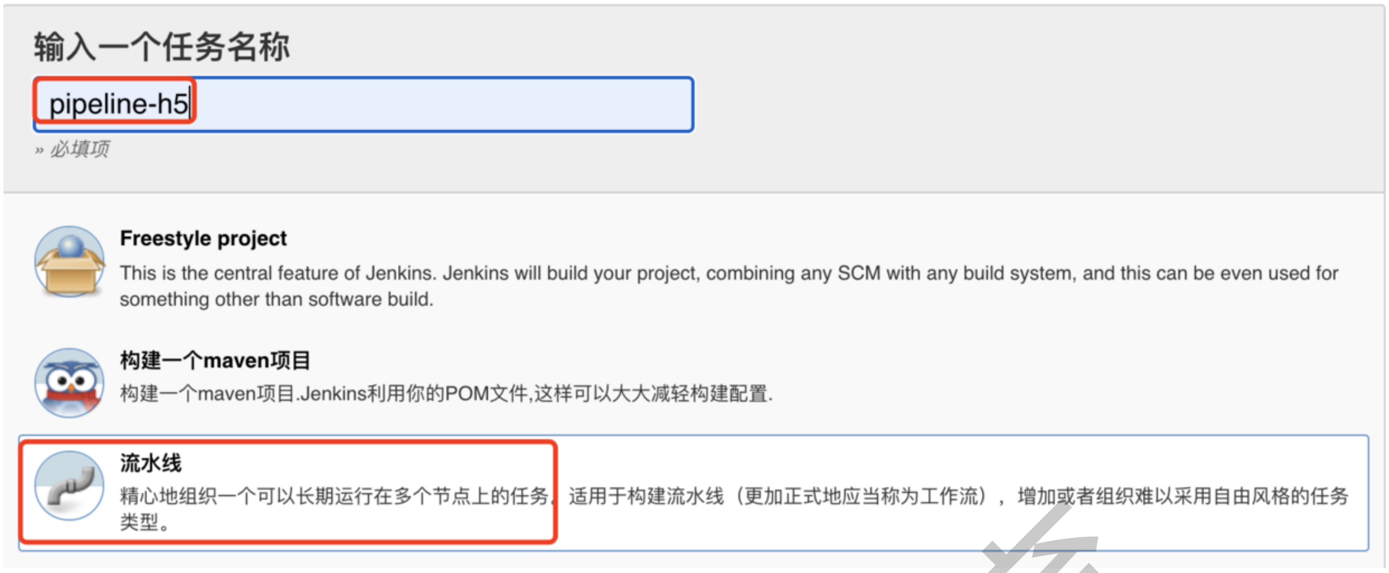
Pipeline pipeline-demo

阶段视图

	Declarative: Checkout SCM	下载代码	编译代码	部署代码
Average stage times: (Average full run time: ~2s)	597ms	56ms	104ms	83ms
#6 Aug 22 17:55 1 commit	442ms	71ms	57ms	56ms

第4章 pipeline改造h5项目

1.创建pipeline项目



输入一个任务名称

pipeline-h5

» 必填项

Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

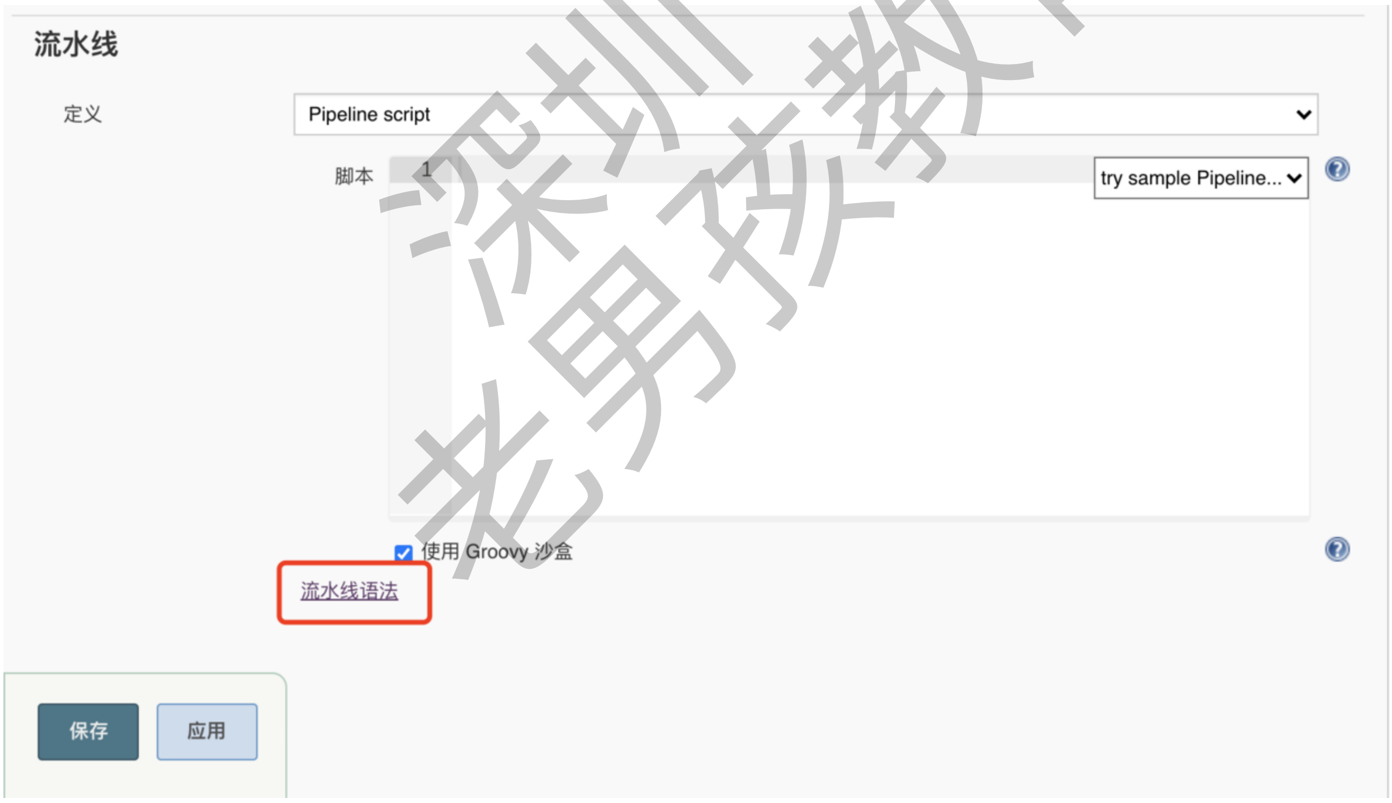
构建一个maven项目

构建一个maven项目.Jenkins利用你的POM文件,这样可以大大减轻构建配置.

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。

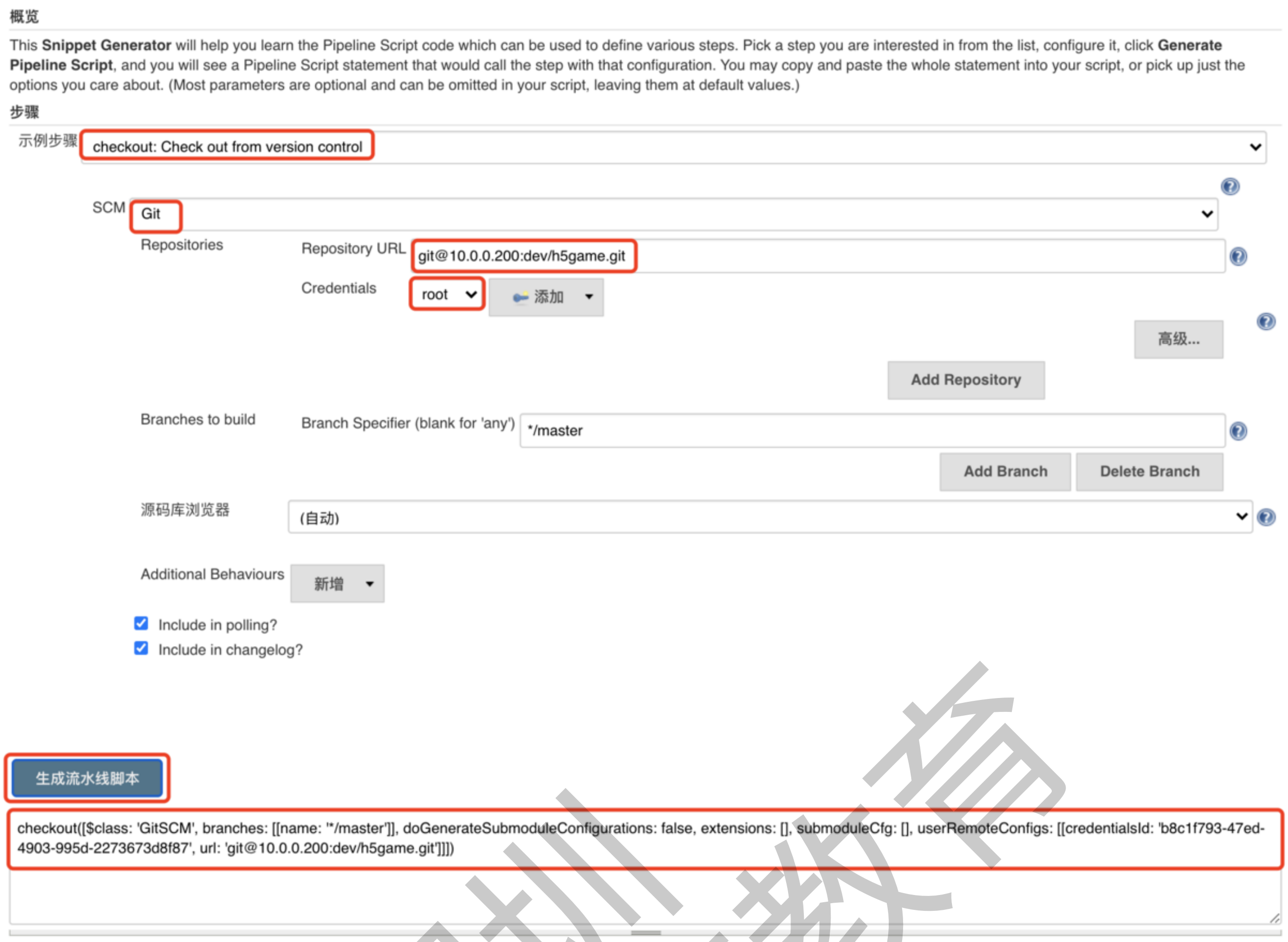
2.jenkins生成拉取代码的pipeline语法



流水线

定义: Pipeline script

脚本



概览

This **Snippet Generator** will help you learn the Pipeline Script code which can be used to define various steps. Pick a step you are interested in from the list, configure it, click **Generate Pipeline Script**, and you will see a Pipeline Script statement that would call the step with that configuration. You may copy and paste the whole statement into your script, or pick up just the options you care about. (Most parameters are optional and can be omitted in your script, leaving them at default values.)

步骤

示例步骤: checkout: Check out from version control

SCM: Git

Repositories — Repository URL: git@10.0.0.200:dev/h5game.git

Credentials: root

Branches to build — Branch Specifier (blank for 'any'): */master

源码库浏览器: (自动)

Additional Behaviours

✓ Include in polling?

✓ Include in changelog?

```
checkout([$class: 'GitSCM', branches: [[name: '*/master']], doGenerateSubmoduleConfigurations: false, extensions: [], submoduleCfg: [], userRemoteConfigs: [[credentialsId: 'b8c1f793-47ed-4903-995d-2273673d8f87', url: 'git@10.0.0.200:dev/h5game.git']]])
```

3.编写pipeline file

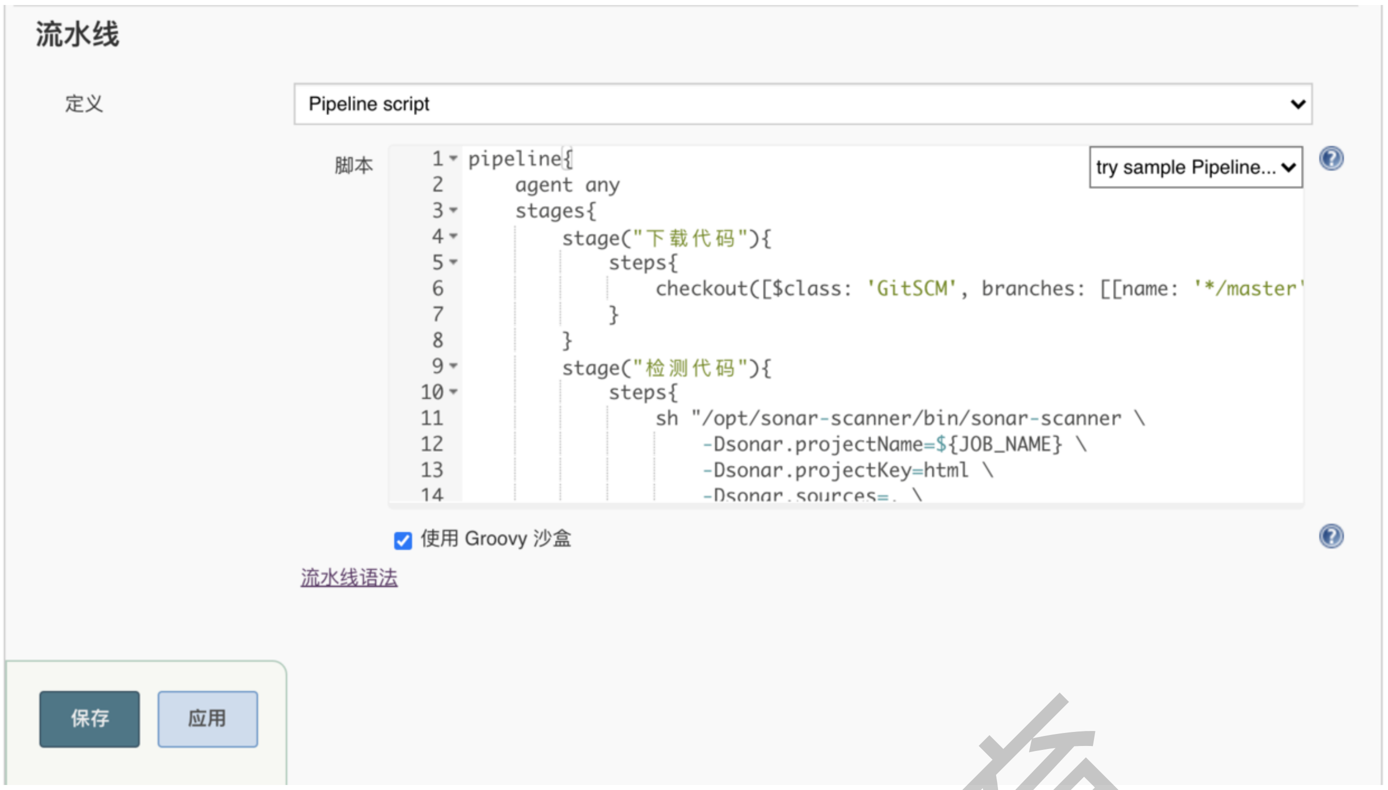
Pipeline代码如下：

```
pipeline{
    agent any
    environment {
        PATH=$PATH:/opt/node/bin
    }
    stages{
        stage("下载代码"){
            steps{
                checkout([$class: 'GitSCM', branches: [[name: '*/master']], doGenerateSubmoduleConfigurations: false, extensions: [], submoduleCfg: [], userRemoteConfigs: [[credentialsId: 'b8c1f793-47ed-4903-995d-2273673d8f87', url: 'git@10.0.0.200:dev/h5game.git']]])
            }
        }
        stage("检测代码"){
            steps{
                sh "/opt/sonar-scanner/bin/sonar-scanner  \
                    -Dsonar.projectName=${JOB_NAME} \
                    -Dsonar.projectKey=html \
                    -Dsonar.sources=. \
                    -Dsonar.host.url=http://10.0.0.203:9000 \
                    -Dsonar.login=4f57dfb332463fa8220be49856a0f1d27c88a142"
            }
        }
        stage("编译代码"){
            steps{
                echo "packge code OK"
            }
        }
        stage("部署代码"){
            steps{
                sh "sh -x /scripts/jenkins/deploy.sh"
            }
        }
    }
}
```

部署脚本如下：

```
#!/bin/bash

PATH_CODE=/var/lib/jenkins/workspace/${JOB_NAME}
PATH_WEB=/usr/share/nginx
TIME=$(date +%Y%m%d-%H%M)
IP=10.0.0.7

#打包代码
cd ${PATH_CODE}
tar zcf /opt/${TIME}-web.tar.gz ./*

#拷贝打包好的代码发送到web服务器代码目录
ssh ${IP} "mkdir ${PATH_WEB}/${TIME}-web -p"
scp /opt/${TIME}-web.tar.gz ${IP}:${PATH_WEB}/${TIME}-web

#web服务器解压代码
ssh ${IP} "cd ${PATH_WEB}/${TIME}-web && tar xf ${TIME}-web.tar.gz && rm -rf ${TIME}-web.tar.gz"
ssh ${IP} "cd ${PATH_WEB} && rm -rf html && ln -s ${TIME}-web html"
```

jenkins配置如下：

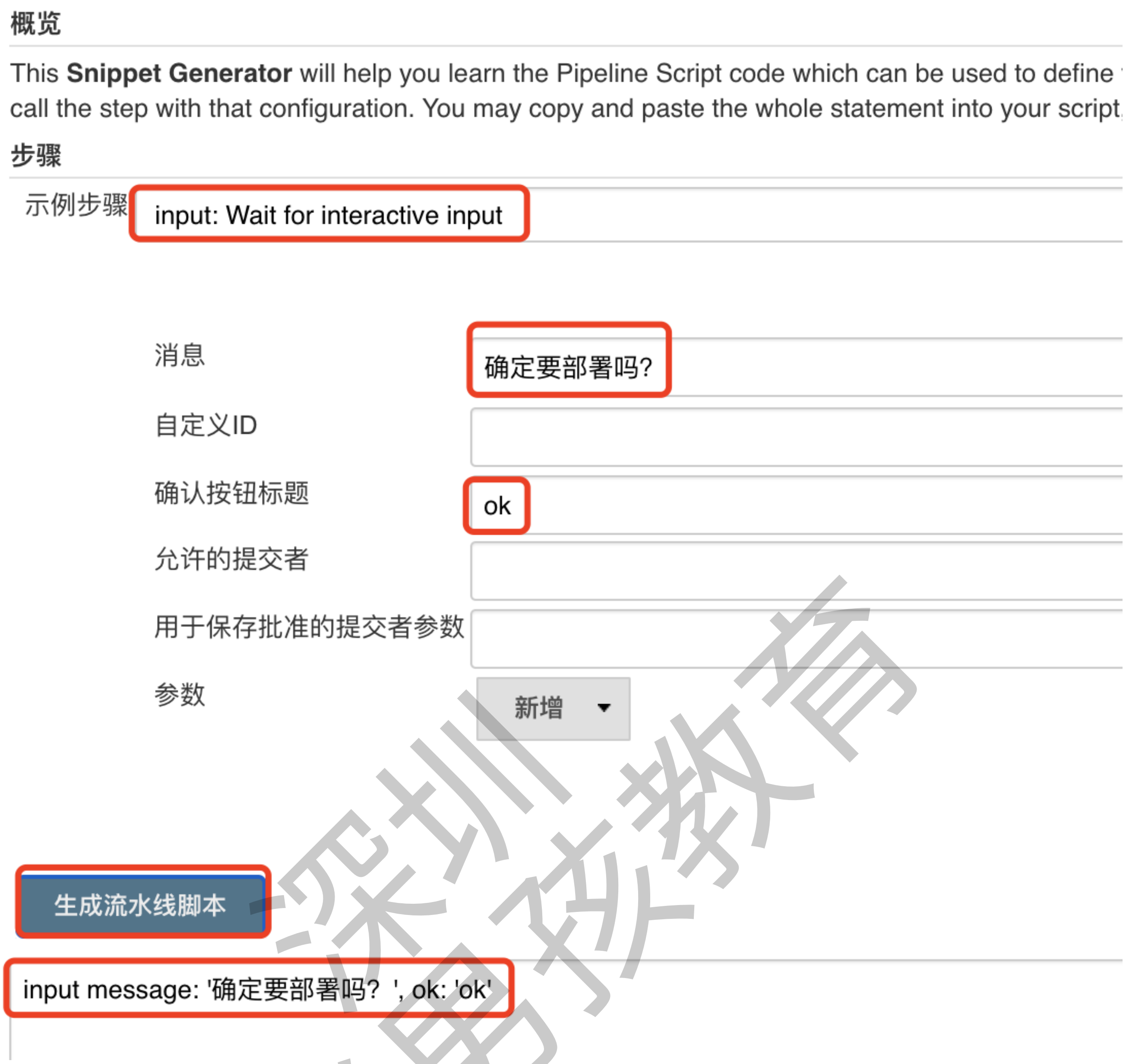


```
pipeline{
    agent any
    stages{
        stage("下载代码"){
            steps{
                checkout([$class: 'GitSCM', branches: [[name: '*/master'
            }
        }
        stage("检测代码"){
            steps{
                sh "/opt/sonar-scanner/bin/sonar-scanner \
                    -Dsonar.projectName=${JOB_NAME} \
                    -Dsonar.projectKey=html \
                    -Dsonar.sources=. \
```

4.构建

5.增加确认环节

生成交互确认的pipeline代码


概览

This **Snippet Generator** will help you learn the Pipeline Script code which can be used to define
call the step with that configuration. You may copy and paste the whole statement into your script

步骤

示例步骤 input: Wait for interactive input

消息 确定要部署吗?

自定义ID

确认按钮标题 ok

允许的提交者

用于保存批准的提交者参数

参数 新增

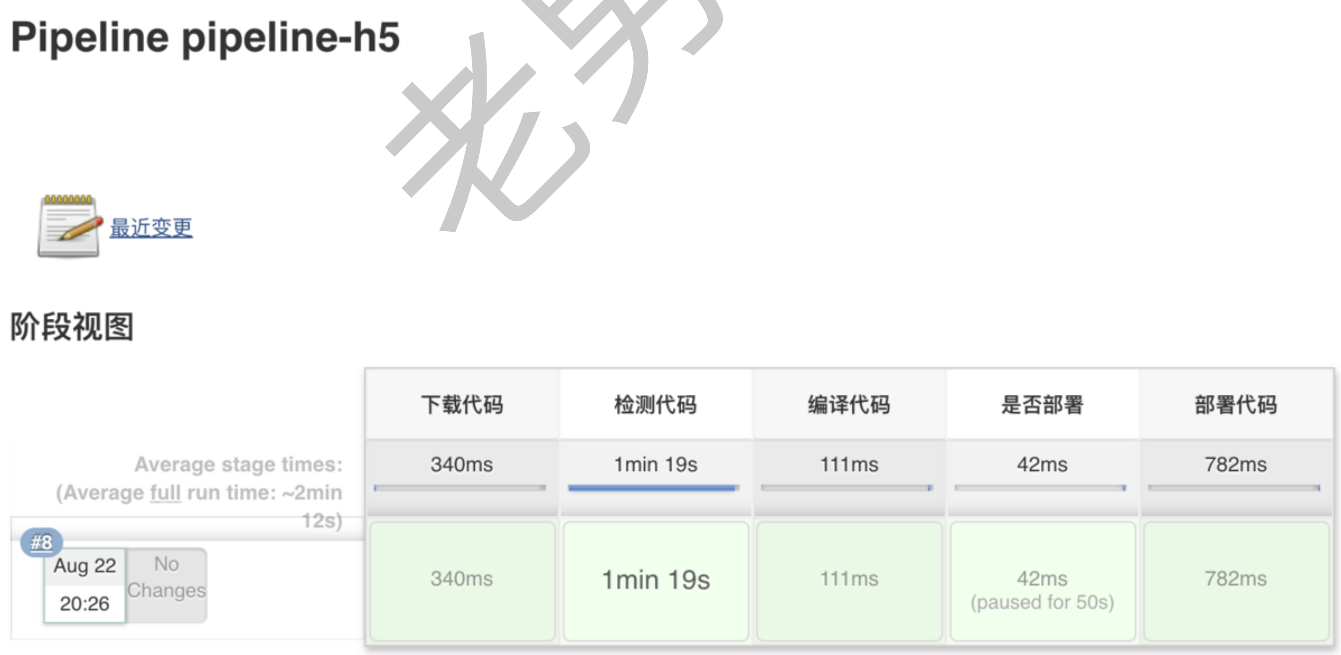
input message: '确定要部署吗？ ', ok: 'ok'

增加相关代码片段:

```
pipeline{
    agent any
    stages{
        stage("下载代码"){
            steps{
                checkout([$class: 'GitSCM', branches: [[name: '*/master']],
doGenerateSubmoduleConfigurations: false, extensions: [], submoduleCfg: [],
userRemoteConfigs: [[credentialsId: 'b8c1f793-47ed-4903-995d-2273673d8f87', url:
'git@10.0.0.200:dev/h5game.git']]])
            }
        }
        stage("检测代码"){
            steps{
                sh "/opt/sonar-scanner/bin/sonar-scanner  \
                    -Dsonar.projectName=${JOB_NAME} \
                    -Dsonar.projectKey=html \
                    -Dsonar.sources=. \
                    -Dsonar.host.url=http://10.0.0.203:9000 \
                    -Dsonar.login=4f57dfb332463fa8220be49856a0f1d27c88a142"
            }
        }
        stage("编译代码"){
            steps{
                echo "packge code OK"
            }
        }
        stage("是否部署"){
            steps{
                input message: '确定要部署吗? ', ok: 'ok'
            }

        }
        stage("部署代码"){
            steps{
                sh "sh -x /scripts/jenkins/deploy.sh"
            }
        }
    }
}
```

6.构建测试

此时会提示我们是否ok，点击ok之后部署成功



Pipeline pipeline-h5

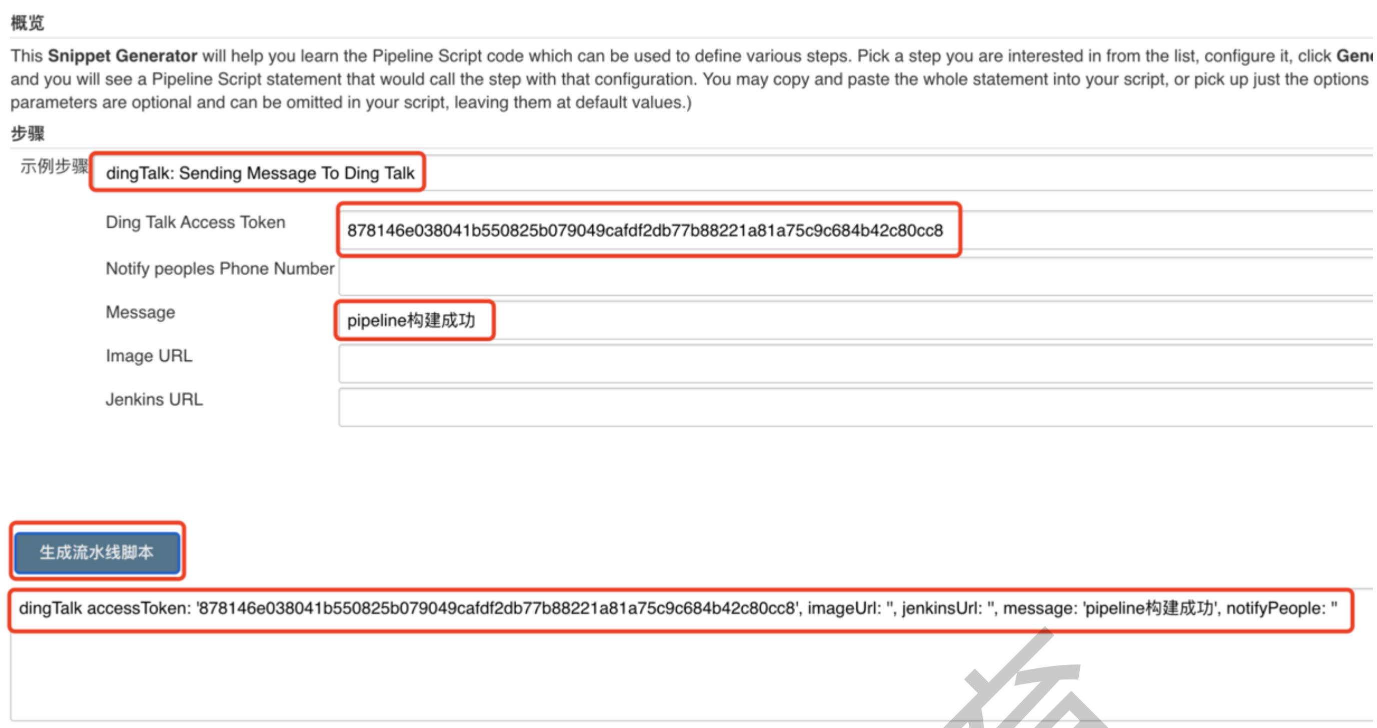
最近变更

阶段视图

	下载代码	检测代码	编译代码	是否部署	部署代码
Average stage times: (Average full run time: ~2min 12s)	340ms	1min 19s	111ms	42ms	782ms
#8 Aug 22 20:26 No Changes	340ms	1min 19s	111ms	42ms (paused for 50s)	782ms

7.增加构建结果通知动作

查询通知语法


概览

This **Snippet Generator** will help you learn the Pipeline Script code which can be used to define various steps. Pick a step you are interested in from the list, configure it, click **Gen**
and you will see a Pipeline Script statement that would call the step with that configuration. You may copy and paste the whole statement into your script, or pick up just the options
parameters are optional and can be omitted in your script, leaving them at default values.)

步骤

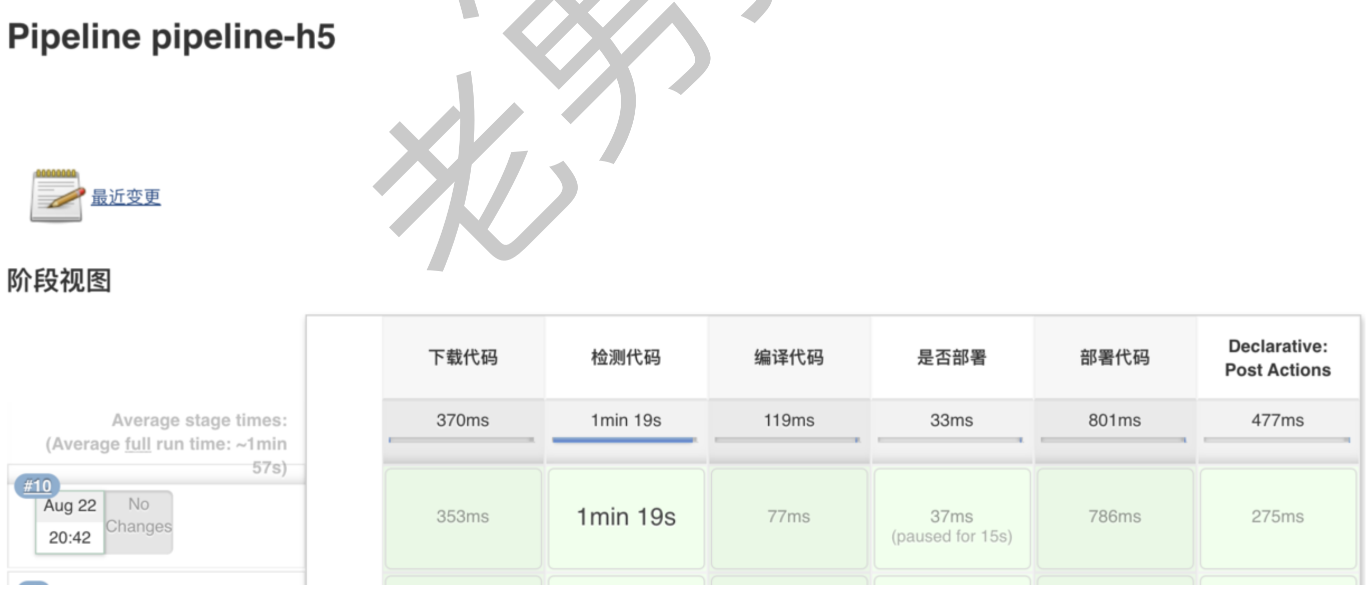
示例步骤	dingTalk: Sending Message To Ding Talk
Ding Talk Access Token	878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8
Notify peoples Phone Number	
Message	pipeline构建成功
Image URL	
Jenkins URL	

```
dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建成功', notifyPeople: ''
```

修改pipeleine增加相关代码

```
pipeline{
    agent any
    stages{
        stage("下载代码"){
            steps{
                checkout([$class: 'GitSCM', branches: [[name: '*/master']], doGenerateSubmoduleConfigurations: false, extensions: [], submoduleCfg: [], userRemoteConfigs: [[credentialsId: 'b8c1f793-47ed-4903-995d-2273673d8f87', url: 'git@10.0.0.200:dev/h5game.git']]])
            }
        }
        stage("检测代码"){
            steps{
                sh "/opt/sonar-scanner/bin/sonar-scanner  \
                    -Dsonar.projectName=${JOB_NAME} \
                    -Dsonar.projectKey=html \
                    -Dsonar.sources=. \
                    -Dsonar.host.url=http://10.0.0.203:9000 \
                    -Dsonar.login=4f57dfb332463fa8220be49856a0f1d27c88a142"
            }
        }
        stage("编译代码"){
            steps{
                echo "packge code OK"
            }
        }
        stage("是否部署"){
            steps{
                input message: '确定要部署吗? ', ok: 'ok'
            }

        }
        stage("部署代码"){
            steps{
                sh "sh -x /scripts/jenkins/deploy.sh"
            }
        }
    }

    post {
        success {
            dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建成功', notifyPeople: ''
        }

        failure {
            dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建失败', notifyPeople: ''
        }
    }
}
```

8.构建测试



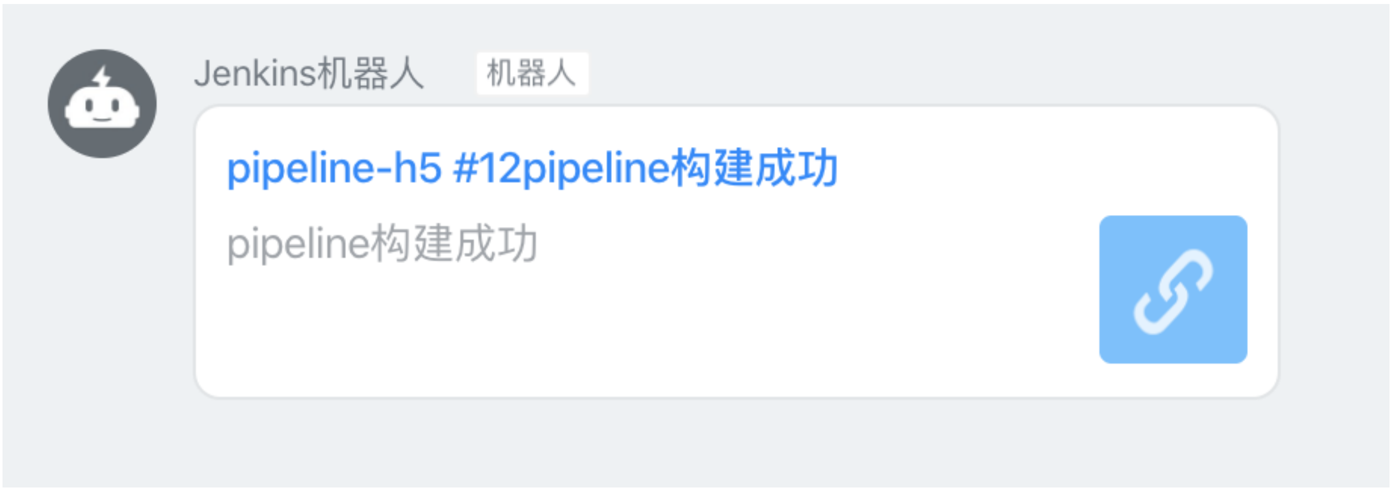
Pipeline pipeline-h5

最近变更

阶段视图

	下载代码	检测代码	编译代码	是否部署	部署代码	Declarative: Post Actions
Average stage times: (Average full run time: ~1min 57s)	370ms	1min 19s	119ms	33ms	801ms	477ms
#10 Aug 22 20:42 No Changes	353ms	1min 19s	77ms	37ms (paused for 15s)	786ms	275ms

9.钉钉查看通知



pipeline-h5 #12pipeline构建成功

pipeline构建成功

第5章 pipeline改造java项目

1.git parameter官方地址

```
https://plugins.jenkins.io/git-parameter/
```

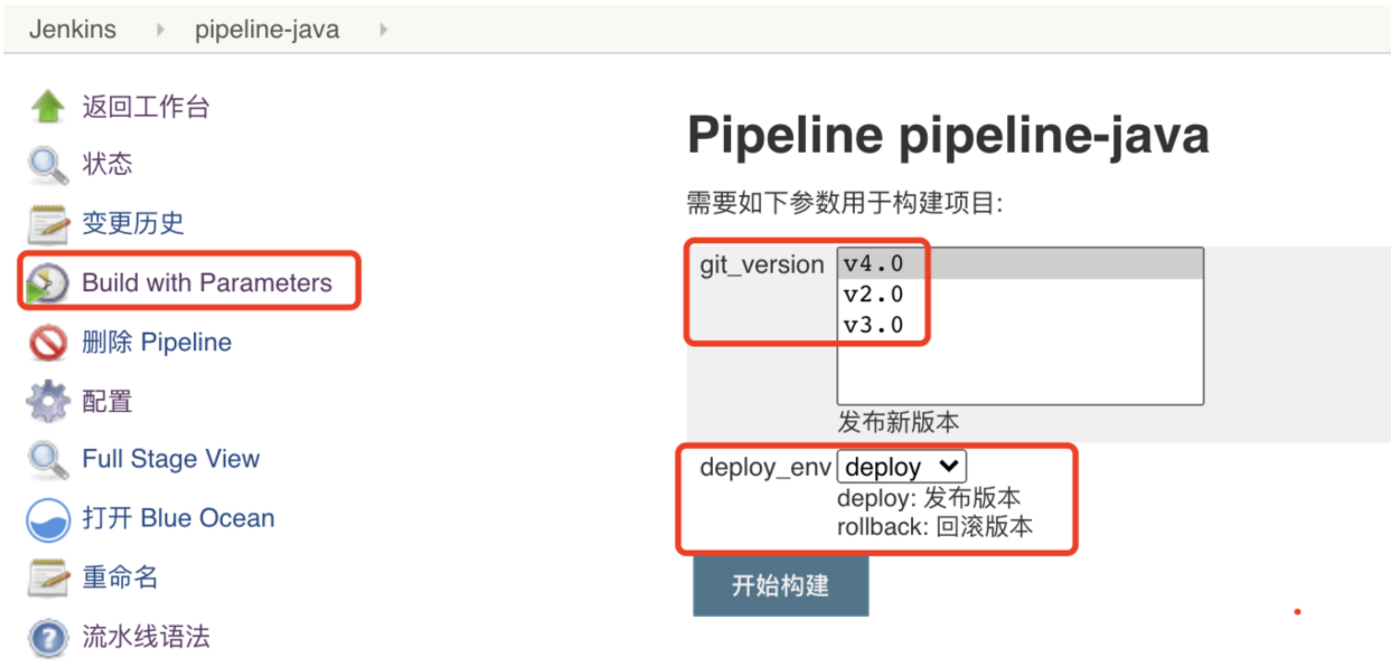
2.发布脚本

```
#!/bin/bash

PATH_CODE=/var/lib/jenkins/workspace/${JOB_NAME}
PATH_WEB=/opt/tomcat/webapps
IP=10.0.0.7

#拷贝war包发送到web服务器代码目录
code_scp(){
        ssh ${IP} "mkdir ${PATH_WEB}/java-${git_version} -p"
        scp ${PATH_CODE}/target/*.war ${IP}:${PATH_WEB}/java-${git_version}
}

#web服务器解压代码
code_unzip(){
        ssh ${IP} "cd ${PATH_WEB}/java-${git_version} && unzip *.war && rm -rf *.war"
}

#创建代码软链接
code_ln(){
        ssh ${IP} "cd ${PATH_WEB} && rm -rf ROOT && ln -s java-${git_version} ROOT"
}

#重启tomcat
restart_tomcat(){
        ssh ${IP} "cd /opt/tomcat/bin && ./shutdown.sh && ./startup.sh"
}

main(){
        code_scp
        code_unzip
        code_ln
}

#选择发布还是回滚
if [ "${deploy_env}" == "deploy" ]
then
        ssh ${IP} "ls ${PATH_WEB}/java-${git_version}" >/dev/null 2>&1
        if [ $? == 0 -a ${GIT_COMMIT} == ${GIT_PREVIOUS_SUCCESSFUL_COMMIT} ]
        then
                echo "java-${git_version} 已部署,不允许重复构建"
                exit
        else
                main
                restart_tomcat
        fi
elif [ "${deploy_env}" == "rollback" ]
then
        code_ln
        restart_tomcat
fi
```

3.pipeline脚本

```
pipeline{
    agent any
    parameters {
        gitParameter name: 'git_version',
                     branchFilter: 'origin/(.*)',
                     type: 'PT_TAG',
                     defaultValue: 'v1.0',
                     description: '发布新版本'
        choice(name: 'deploy_env', choices: ['deploy','rollback'],description: 'deploy: 发布版本\nrollback: 回滚版本')
    }
    stages{
        stage("下载代码"){
            steps{
                checkout([$class: 'GitSCM',
                         branches: [[name: '${git_version}']],
                         doGenerateSubmoduleConfigurations: false,
                         userRemoteConfigs: [[credentialsId: 'b8c1f793-47ed-4903-995d-2273673d8f87',
                         url: 'git@10.0.0.200:dev/java-helloworld.git']]])
            }
        }
        stage("检测代码"){
            steps{
                sh "/opt/sonar-scanner/bin/sonar-scanner  \
                    -Dsonar.projectName=${JOB_NAME} \
                    -Dsonar.projectKey=${JOB_NAME} \
                    -Dsonar.sources=. \
                    -Dsonar.host.url=http://10.0.0.203:9000 \
                    -Dsonar.login=4f57dfb332463fa8220be49856a0f1d27c88a142"
            }
        }
        stage("编译代码"){
            steps{
                sh "/opt/maven/bin/mvn package"
            }
        }
        stage("是否部署"){
            steps{
                input message: '确定要部署吗？', ok: 'ok'
            }

        }
        stage("部署代码"){
            steps{
                sh "sh -x /scripts/jenkins/java_deploy.sh"
            }
        }
    }

    post {
        success {
            dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建成功', notifyPeople: ''
        }

        failure {
            dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建失败', notifyPeople: ''
        }
    }
}
```

4.构建效果


Jenkins ▸ pipeline-java ▸

返回工作台
状态
变更历史
Build with Parameters
删除 Pipeline
配置
Full Stage View
打开 Blue Ocean
重命名
流水线语法

Pipeline pipeline-java

需要如下参数用于构建项目:

git_version: v4.0 / v2.0 / v3.0
发布新版本

deploy_env: deploy
deploy: 发布版本
rollback: 回滚版本

开始构建

第6章 jenkins分布式构建

1.分布式构建介绍

```
```

2.node节点安装软件

```
git
jdk
mvn
sonar-scanner
部署脚本
```

3.配置jenkins

4.node节点查看

```
[root@jenkins-204 ~]# ll /home/jenkins/
总用量 852
drwxr-xr-x 4 root root     34 8月  22 23:21 remoting
-rw-r--r-- 1 root root 872440 8月  22 23:21 remoting.jar

[root@jenkins-204 ~]# ps -ef|grep java
root       1521   1475  0 23:21 ?        00:00:00 bash -c cd "/home/jenkins" && java -jar remoting.jar -workDir /home/jenkins
root       1528   1521  1 23:21 ?        00:00:05 java -jar remoting.jar -workDir /home/jenkins
root       1655   1175  0 23:28 pts/0    00:00:00 grep --color=auto java
```

5.构建测试-指定在node节点构建

以h5项目举例，修改pipeline代码，指定在node节点构建

```
pipeline{
    agent { label 'node1' }
    stages{
        stage("下载代码"){
            steps{
                checkout([$class: 'GitSCM', branches: [[name: '*/master']], doGenerateSubmoduleConfigurations: false, extensions: [], submoduleCfg: [], userRemoteConfigs: [[credentialsId: 'b8c1f793-47ed-4903-995d-2273673d8f87', url: 'git@10.0.0.200:dev/h5game.git']]])
            }
        }
        stage("检测代码"){
            steps{
                sh "/opt/sonar-scanner/bin/sonar-scanner  \
                    -Dsonar.projectName=${JOB_NAME} \
                    -Dsonar.projectKey=html \
                    -Dsonar.sources=. \
                    -Dsonar.host.url=http://10.0.0.203:9000 \
                    -Dsonar.login=4f57dfb332463fa8220be49856a0f1d27c88a142"
            }
        }
        stage("编译代码"){
            steps{
                echo "packge code OK"
            }
        }
        stage("是否部署"){
            steps{
                input message: '确定要部署吗? ', ok: 'ok'
            }

        }
        stage("部署代码"){
            steps{
                sh "sh -x /scripts/jenkins/deploy.sh"
            }
        }
    }

    post {
        success {
            dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建成功', notifyPeople: ''
        }

        failure {
            dingTalk accessToken: '878146e038041b550825b079049cafdf2db77b88221a81a75c9c684b42c80cc8', imageUrl: '', jenkinsUrl: '', message: 'pipeline构建失败', notifyPeople: ''
        }
    }
}
```

执行效果如下：