Jenkins Pipeline

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Pipeline as Code

- In Jenkins pipeline refers to a **suite of plugins** that support implementing and integrating continuous delivery and integration(CI/CD)
  - Pipeline as a code is a Jenkinsfile that is written in Groovy syntax (Scripting) and resides in the source code.
    - Stage and steps
    - Declarative and scripted syntax
    - Provide a rich ecosystem of plugins
    - Visualization and monitoring

1. New item
2. Select pipeline
3. Go to the pipeline in configuration and select pipeline script

```
pipeline {
        agent any
        stages {
                stage('Hello') {
                        steps {
                          echo 'Hello World'          }
                }
        }
}
```

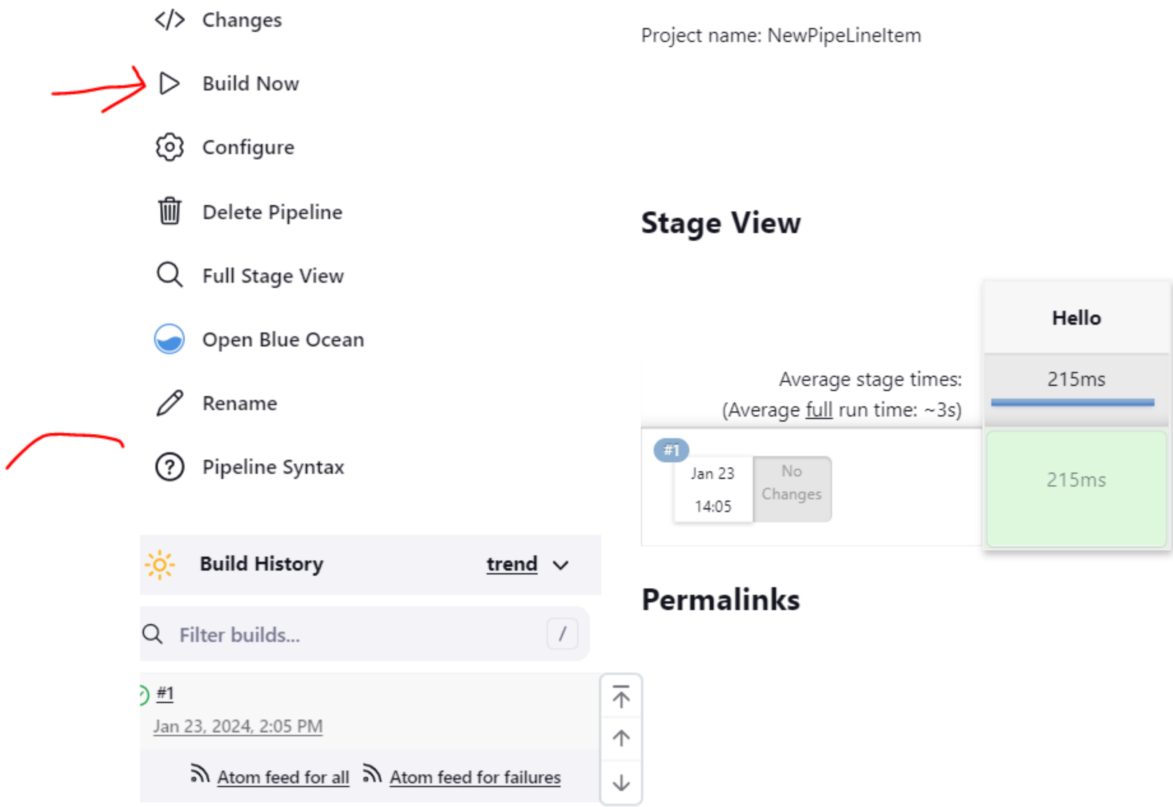
Which version any means master

Stage Name

Print hello world

4. Apply and Save
4. Build

Build the pipeline



Project name: NewPipeLineItem

Stage View

	Hello
Average stage times: (Average full run time: ~3s)	215ms
#1 Jan 23 14:05 No Changes	215ms

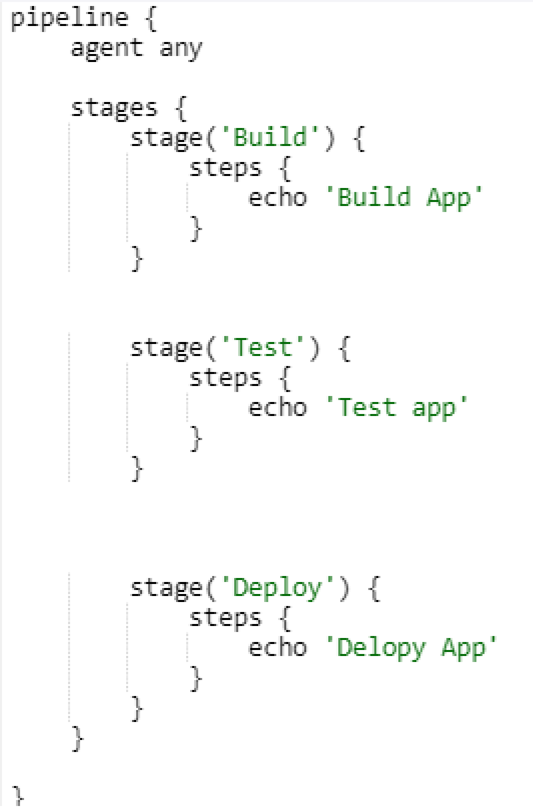
Permalinks

#1
Jan 23, 2024, 2:05 PM

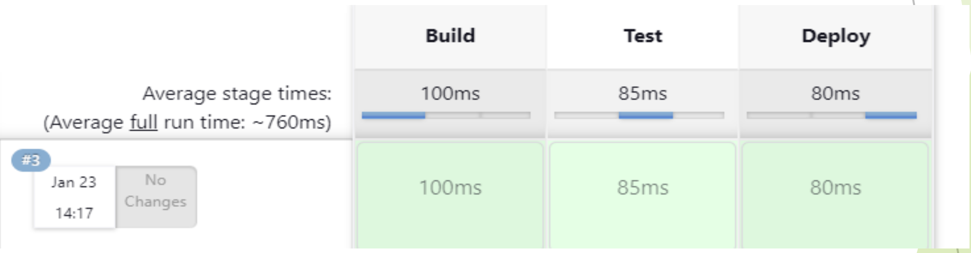
Atom feed for all Atom feed for failures

Lets create a proper pipeline

- Three stages
  - Built, Test, Deploye



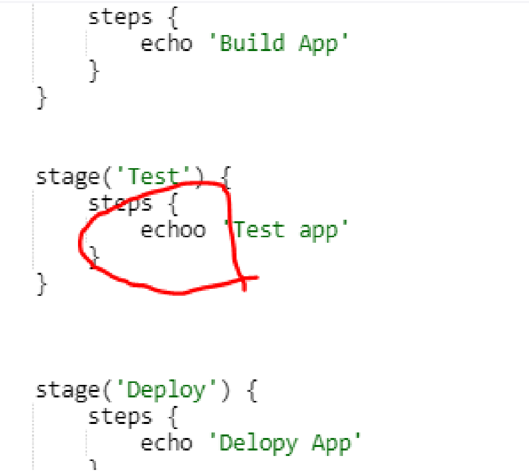
```
pipeline {
    agent any

    stages {
        stage('Build') {
            steps {
                echo 'Build App'
            }
        }


        stage('Test') {
            steps {
                echo 'Test app'
            }
        }



        stage('Deploy') {
            steps {
                echo 'Delopy App'
            }
        }
    }

}
```



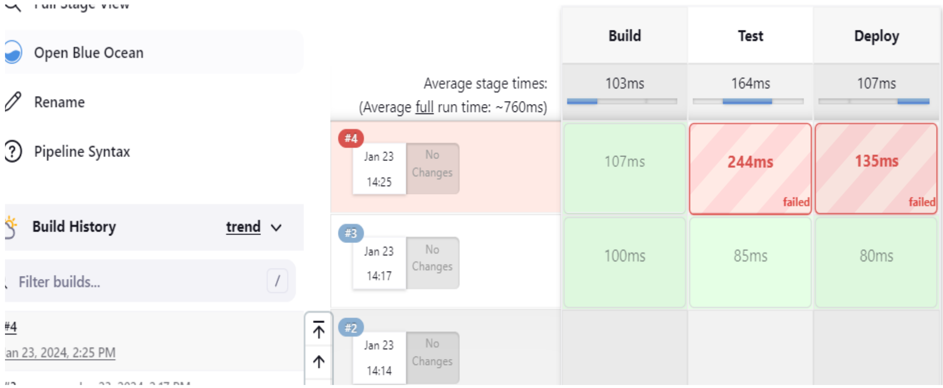
	Build	Test	Deploy
Average stage times: (Average full run time: ~760ms)	100ms	85ms	80ms
#3 Jan 23 14:17 No Changes	100ms	85ms	80ms

Error

- Pipeline error (i.e., Syntax echo-→ echoo)

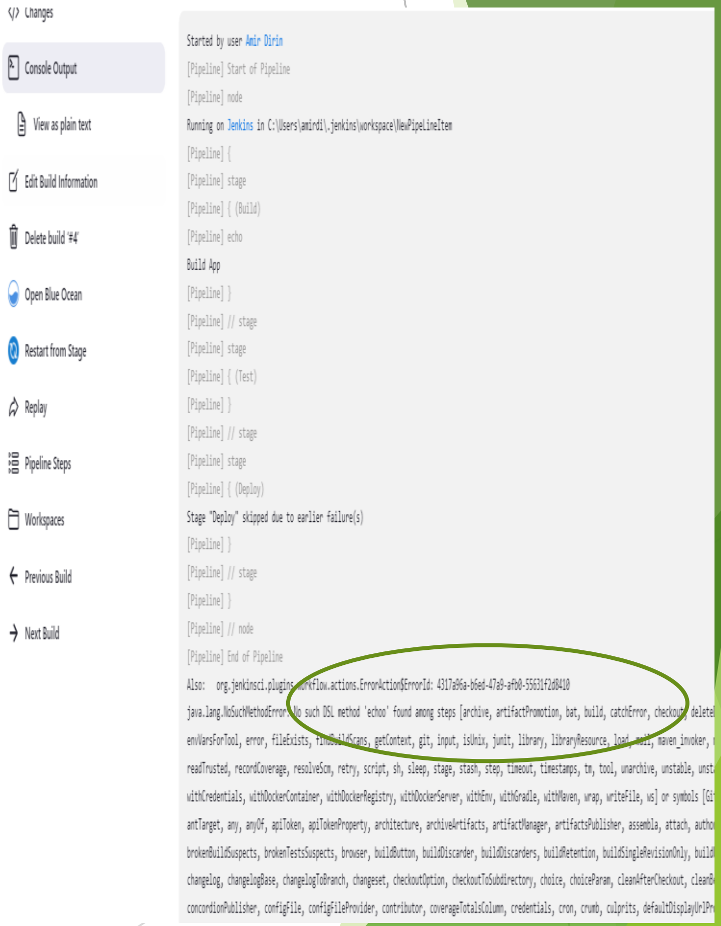


```
    steps {
        echo 'Build App'
    }
}

stage('Test') {
    steps {
        echoo 'Test app'
    }
}

stage('Deploy') {
    steps {
        echo 'Delopy App'
    }
```



#4
an 23, 2024, 2:25 PM

	Build	Test	Deploy
Average stage times: (Average full run time: ~760ms)	103ms	164ms	107ms
#4 Jan 23 14:25 No Changes	107ms	244ms failed	135ms failed
#3 Jan 23 14:17 No Changes	100ms	85ms	80ms
#2 Jan 23 14:14 No Changes			

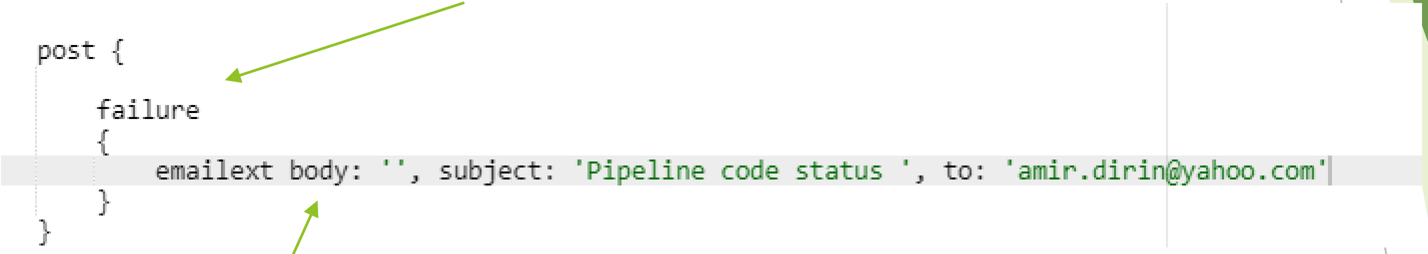


```
Started by user Amir Dirin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in C:\Users\amirdi\.jenkins\workspace\NewPipeLineItem
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Build)
[Pipeline] echo
Build App
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Test)
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
Stage "Deploy" skipped due to earlier failure(s)
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Also:   org.jenkinsci.plugins.workflow.actions.ErrorAction$ErrorId: 4317a96a-b6ed-47a9-afb0-55631f2d8410
java.lang.NoSuchMethodError: No such DSL method 'echoo' found among steps [archive, artifactPromotion, bat, build, catchError, checkout, delete
envVarsForTool, error, fileExists, findBuildScans, getContext, git, input, isUnix, junit, library, libraryResource, load, mail, maven_invoker, 
readTrusted, recordCoverage, resolveScm, retry, script, sh, sleep, stage, stash, step, timeout, timestamps, tm, tool, unarchive, unstable, unst
withCredentials, withDockerContainer, withDockerRegistry, withDockerServer, withEnv, withGradle, withMaven, wrap, writeFile, ws] or symbols [Gi
antTarget, any, anyOf, apiToken, apiTokenProperty, architecture, archiveArtifacts, artifactManager, artifactsPublisher, assembla, attach, autho
brokenBuildSuspects, brokenTestsSuspects, browser, buildButton, buildDiscarder, buildDiscarders, buildRetention, buildSingleRevisionOnly, build
changelog, changelogBase, changelogToBranch, changeset, checkoutOption, checkoutToSubdirectory, choice, choiceParam, cleanAfterCheckout, cleanB
concordionPublisher, configFile, configFileProvider, contributor, coverageTotalsColumn, credentials, cron, crumb, culprits, defaultDisplayUrlPr
```

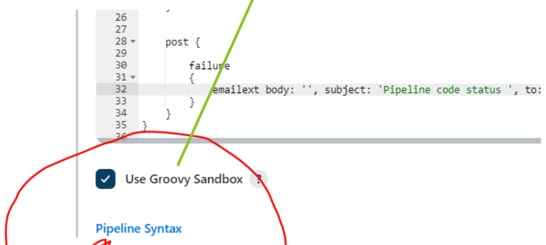
Post Method in Pipeline

- In case of an error we may notify the dev for example

Always



```
post {

    failure
    {
        emailext body: '', subject: 'Pipeline code status ', to: 'amir.dirin@yahoo.com'
    }
}
```



```
post {

    failure
    {
        emailext body: '', subject: 'Pipeline code status ', to:
    }
}
```

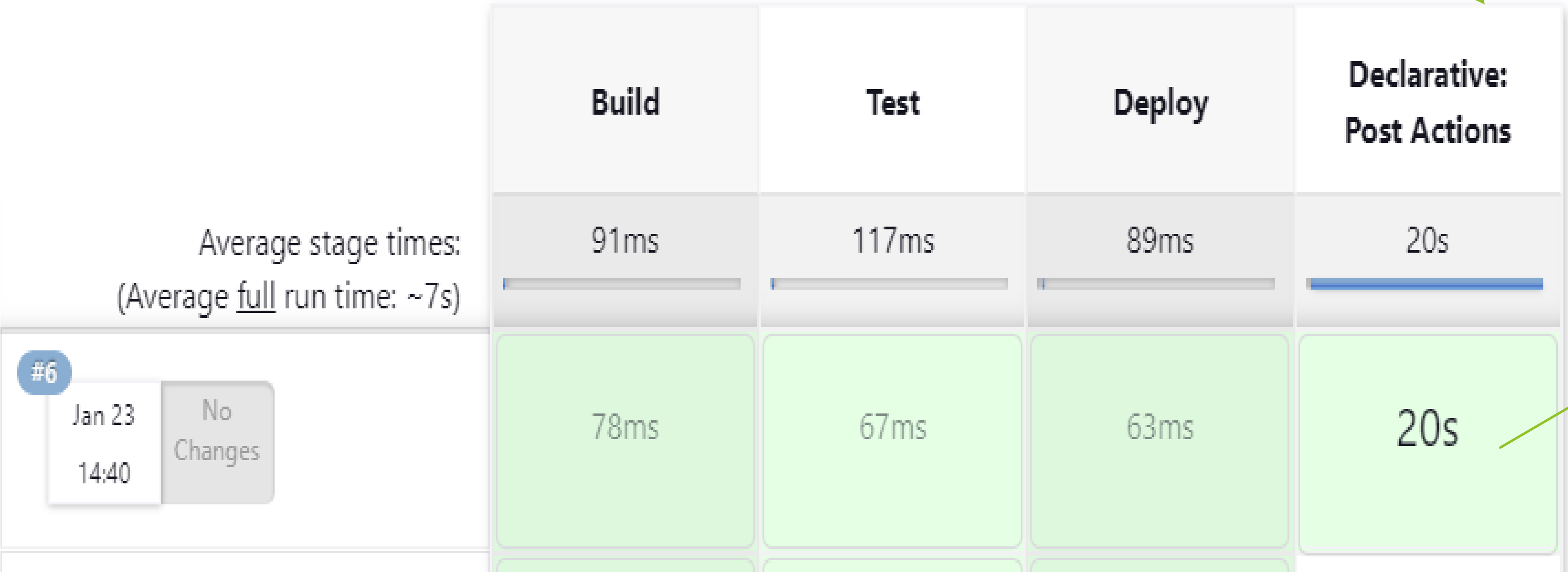
☑ Use Groovy Sandbox

Pipeline Syntax

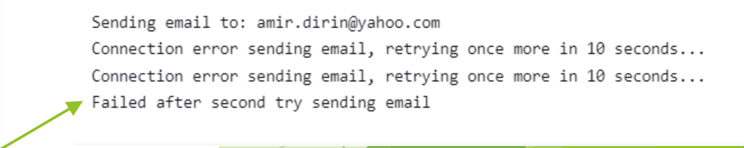
For generating syntax Jenkins have this options

Here is the results

Post actions



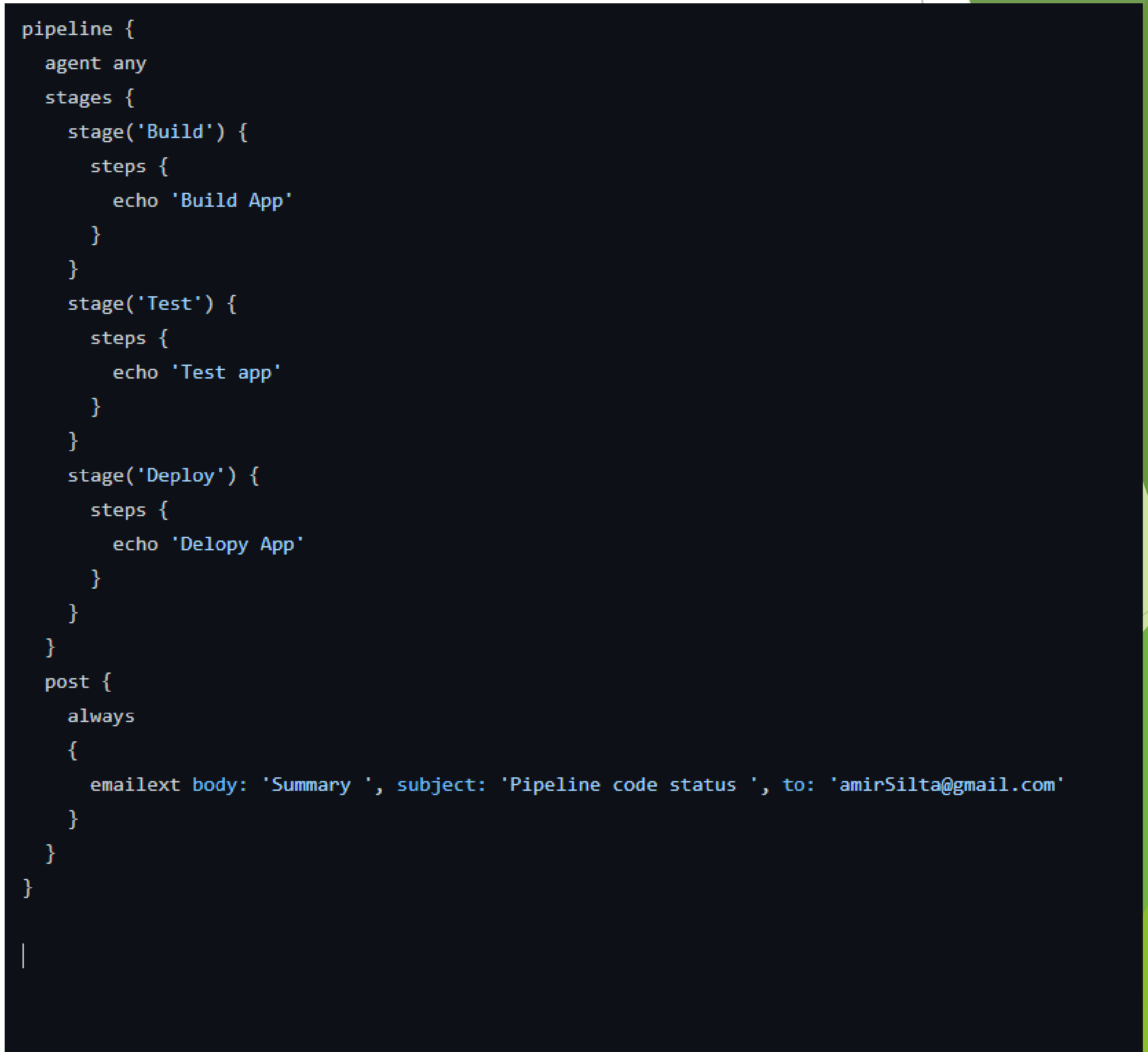
	Build	Test	Deploy	Declarative: Post Actions
Average stage times: (Average full run time: ~7s)	91ms	117ms	89ms	20s
#6 Jan 23 14:40 No Changes	78ms	67ms	63ms	20s



```
Sending email to: amir.dirin@yahoo.com
Connection error sending email, retrying once more in 10 seconds...
Connection error sending email, retrying once more in 10 seconds...
Failed after second try sending email
```

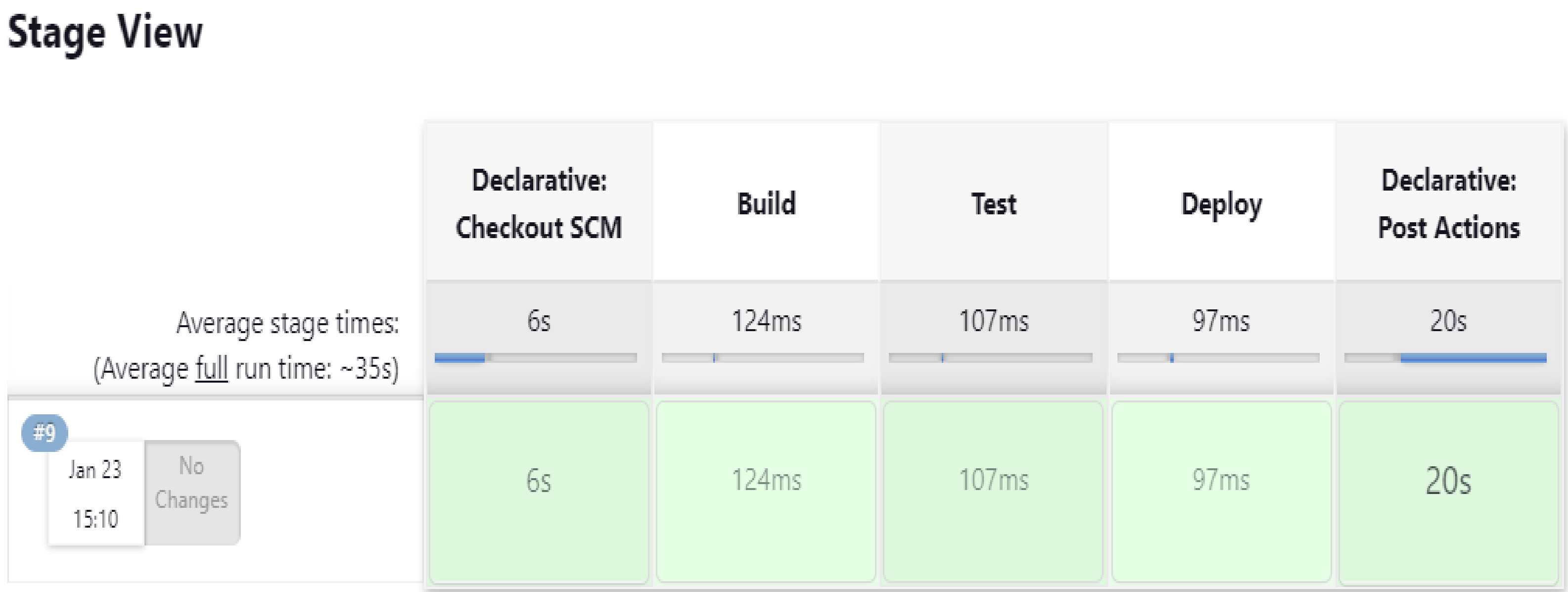
Pipeline that is usable in all Maven files

- pipeline { agent any stages { stage('Build') { steps { echo 'Build App' } } stage('Test') { steps { echo 'Test app' } } stage('Deploy') { steps { echo 'Delopy App' } } } post { always { emailext body: 'Summary ', subject: 'Pipeline code status ', to: 'amirSilta@gmail.com' } }}



```
pipeline {
  agent any
  stages {
    stage('Build') {
      steps {
        echo 'Build App'
      }
    }
    stage('Test') {
      steps {
        echo 'Test app'
      }
    }
    stage('Deploy') {
      steps {
        echo 'Delopy App'
      }
    }
  }
  post {
    always
    {
      emailext body: 'Summary ', subject: 'Pipeline code status ', to: 'amirSilta@gmail.com'
    }
  }
}
```

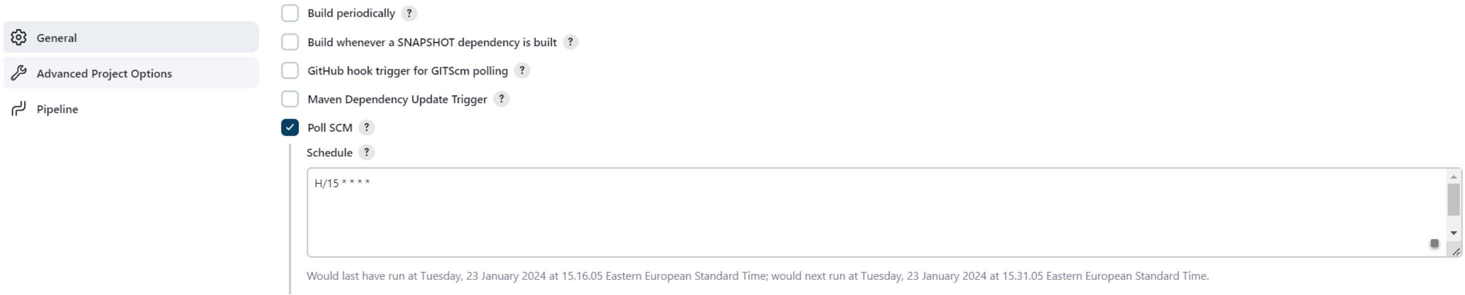
Jenkins file in Maven in git hub



Stage View

	Declarative: Checkout SCM	Build	Test	Deploy	Declarative: Post Actions
Average stage times: (Average full run time: ~35s)	6s	124ms	107ms	97ms	20s
#9 Jan 23 15:10 No Changes	6s	124ms	107ms	97ms	20s

We may have the build trigger



□ Build periodically ?

□ Build whenever a SNAPSHOT dependency is built ?

□ GitHub hook trigger for GITScm polling ?

□ Maven Dependency Update Trigger ?

☑ Poll SCM ?

Schedule ?

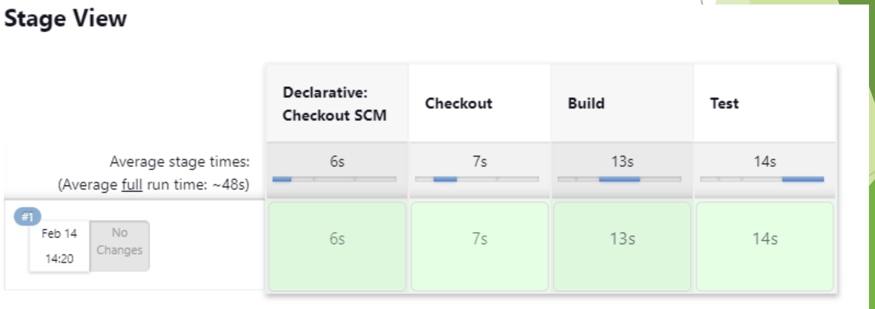
```
H/15 * * * *
```

Would last have run at Tuesday, 23 January 2024 at 15.16.05 Eastern European Standard Time; would next run at Tuesday, 23 January 2024 at 15.31.05 Eastern European Standard Time.

Example Pipeline in Github

- https://github.com/ADirin/lectureDemoJenkisExample_F2024.git

```
pipeline {
    agent any
    environment {
        PATH = "${env.PATH};C:\\Windows\\System32" // Update the PATH to include the directory of cmd.exe
        GIT_CREDENTIALS = credentials('ADirin')
    }

    stages {
        stage('Checkout') {
            steps {
                git branch: 'master', credentialsId: 'ADirin', url: 'https://github.com/ADirin/FarToCel_Fall2024.git'
            }
        }
        stage('Build') {
           steps {
               bat 'mvn clean install'
           }
        }
        stage('Test') {
           steps{
               bat 'mvn test'
           }
            post {
                success {
                    // Publish JUnit test results
                    junit '**/target/surefire-reports/TEST-*.xml'
                    // Generate JaCoCo code coverage report
                    jacoco(execPattern: '**/target/jacoco.exec')
                }
            }
        }
    }
}
```



Stage View

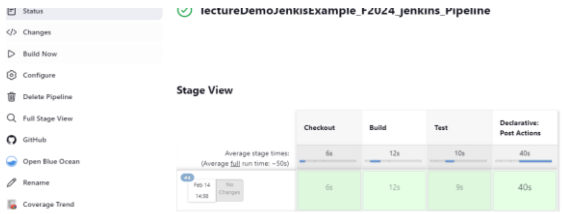
	Declarative: Checkout SCM	Checkout	Build	Test
Average stage times: (Average full run time: ~48s)	6s	7s	13s	14s
#1 Feb 14 14:20 No Changes	6s	7s	13s	14s

Jenkins: lectureDemoJenkisExample_F2024_Git_Pipeline

Example pipeline in Jenkins

- https://github.com/ADirin/lectureDemoJenkisExample_F2024.git

```
pipeline {
    agent any // Define an agent to execute the pipeline on any available executor

    environment {
        PATH = "${env.PATH};C:\\Windows\\System32" // Update the PATH to include the directory of cmd.exe
        GIT_CREDENTIALS = credentials('ADirin') // Define a Git credentials variable
    }

    stages {
        stage('Checkout') { // Define a stage for checking out the source code
            steps {
                git branch: 'master', credentialsId: 'ADirin', url: 'https://github.com/ADirin/FarToCel_Fall2024.git' // Checkout the
repository from GitHub
            }
        }
        stage('Build') { // Define a stage for building the project
           steps {
               bat 'mvn clean install' // Execute Maven command to clean and install dependencies
           }
        }
        stage('Test') { // Define a stage for running tests
           steps {
               bat 'mvn test' // Execute Maven command to run tests
           }
        }
    }

    post { // Define post-build actions
        success { // Define actions to be executed if the build is successful
            // Publish JUnit test results
            junit '**/target/surefire-reports/TEST-*.xml'
            // Generate JaCoCo code coverage report
            jacoco(execPattern: '**/target/jacoco.exec')
            // Send email notification on success
            emailext body: 'Latest build and integrations', subject: 'Test Status', to: 'amir.dirin@yahoo.com'
        }
        always { // Define actions to be executed regardless of the build result
            // Always send email notification
            emailext body: 'Latest build and integrations', subject: 'Test Status', to: 'amir.dirin@yahoo.com'
        }
    }
}
```



lectureDemoJenkisExample_F2024_Jenkins_Pipeline

Stage View

	Checkout	Build	Test	Declarative: Post Actions
Average stage times: (Average full run time: ~50s)	6s	12s	10s	40s
#4 Feb 14 14:38 No Changes	6s	12s	9s	40s