

Jenkins Pipeline

Pipeline As Code

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About Me

Lots of Engineers aspire to be full-stack, but I don't. I aspire to be a T-Shaped Engineer.

Hi there 🙋

I am [Kalaiaarasan \(GitHub\)](#), a DevOps Consultant from [IN](#) with 6+ years of experience focusing majorly on Continuous Integration, Continuous Deployment, Continuous Monitoring and process development which includes code compilation, packaging , deployment/release and monitoring. 🌀

I mostly work with CI/CD Setup, Cloud Services, Developing Automation & SRE tools and AI/MLops. 🚀

Introduction

Pipeline script

- Another way of job configuration with help of code

Advantages:

- Can divide the jobs into parts (build /test /deploy/..) & each part can run in each agent.
- Parallel execution of stages are easy to configure so that we can save time
- Each stage can execute with different version of JDK/MVN versions
- Can retrigger from failed stage
- visualize the build flow
- Build can hold for user input (specific user can enter, explain LDAP concept)
- Version control, code review
- pause, restart the build
- In multibranch pipeline scripts will automatically create in subbranches

Types of Pipeline

- Declarative
- scripted

Difference between Declarative and scripted

- Declarative pipeline is a recent addition.
- More simplified and opinionated syntax when compared to scripted

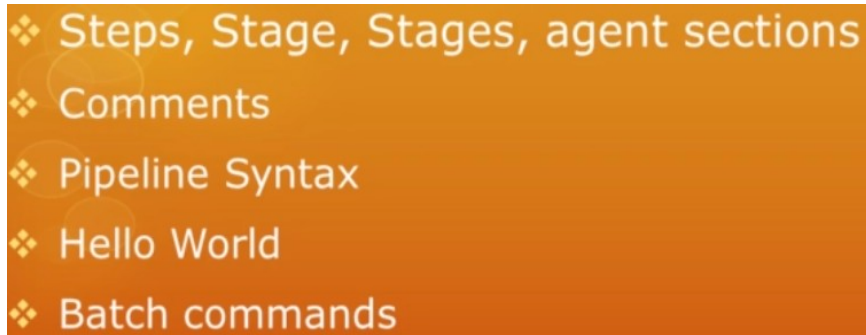
Declarative syntax

```
pipeline {
  agent any
  stages {
    stage('Build') {
      steps {
        //
      }
    }
    stage('Test') {
      steps {
        //
      }
    }
    stage('Deploy') {
      steps {
        //
      }
    }
  }
}
```

Scripted Syntax

```
node {  
    stage('Build') {  
        //  
    }  
    stage('Test') {  
        //  
    }  
    stage('Deploy') {  
        //  
    }  
}
```

PIPELINE BASIC

- 
- ❖ Steps, Stage, Stages, agent sections
 - ❖ Comments
 - ❖ Pipeline Syntax
 - ❖ Hello World
 - ❖ Batch commands

Steps

- We need to write step inside the stage directive
- steps contains (command/scripts) that we used in the build
- One steps directive should be there in stage directive

Stage

- Define particular stage (build/test/deploy/..) of our job
- atleast one stage has to be there
- name will be display on the jenkins dashboard

stages

- contains sequence of stages
- atleast one stage has to be there

Agent

- where (master/slave/container..)we need to run our pipeline script

Stage colors

- White (stage is not executed)
- Green (stage is success)
- Blue lines (stage is executing)
- Redlines or red line (stage is failed)
- Red (few stage success, any one is failed, few remain success stage will show red)

Comments

Single line comment : //

Multiline comment: /*

```
=====
*/
```

Declarative Pipeline Syntax

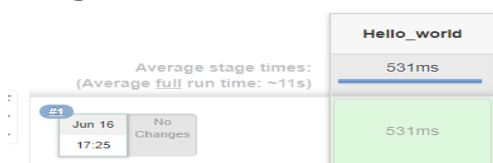
```
pipeline{ //pipeline declaration
  agent <option> //where
  stages{ //stages declaration
    stage("StageName"){ //Stage type : build/test/deploy
      steps{ /* Actual execution stars from here, like
               commands execution, scripts execution etc */
        echo "Hello World" //echo is the print statement
      } // Closed curly brace for steps section
    } //Stage
  } //stages
} // pipeline
```

Simple Hello world pipeline:

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

O/P

Stage View



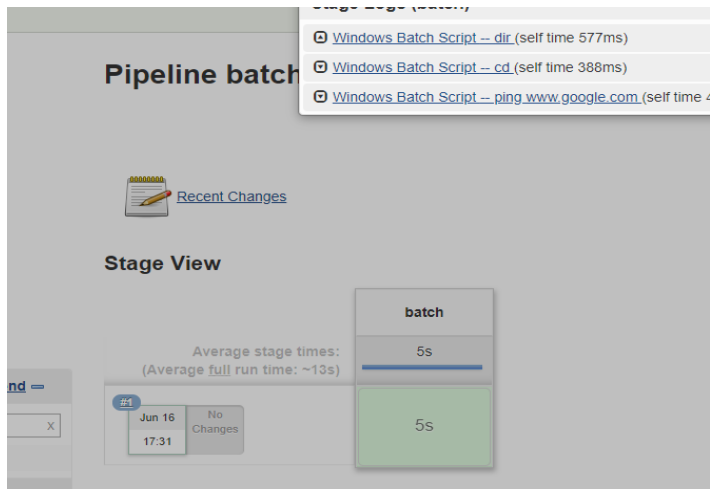
Batch commands

```

pipeline{
  agent any
  stages{
    stage('batch'){
      steps{
        bat "dir"
        bat "cd"
        bat "ping www.google.com"
      }
    }
  }
}

```

O/P



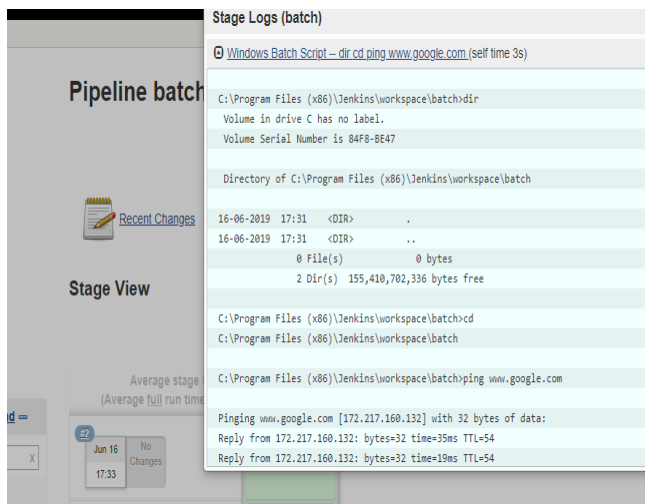
Multiline bat command

```

pipeline{
  agent any
  stages{
    stage('batch'){
      steps{
        bat """
          dir
          cd
          ping www.google.com
        """
      }
    }
  }
}

```

O/P



VARIABLES

Variables

What is the use of Variables

Pre defined Variables

User defined Variables

Scope of Variables

User defined VS Pre defined variables

Params, Difference between Single and Double quotes

Read variables from JSON file

Concatenation

What is variable?

Variable is used to store the value.

<variable name> = <variable value>

Types

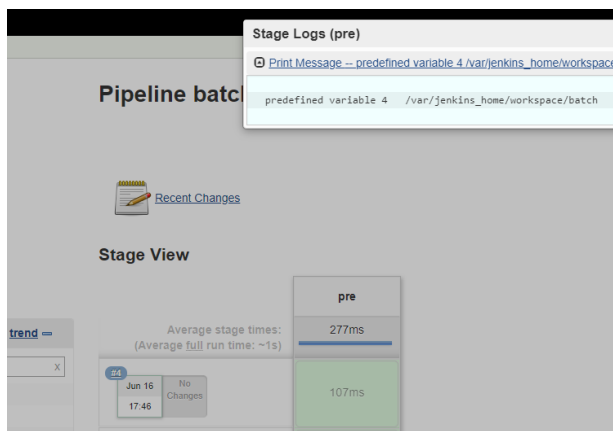
- Predefined variable
- User variable

Predefined:

<http://localhost:8080/env-vars.html>

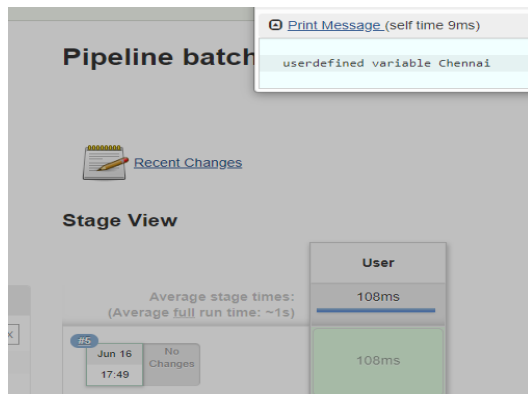
Predefined

```
pipeline{
  agent any
  stages{
    stage('pre'){
      steps{
        echo " predefined variable $BUILD_NUMBER  $WORKSPACE "
      }
    }
  }
}
```



Userdefined : variable we can define in rootlevel or stage level

```
pipeline{
  agent any
  environment{
    MYHOME="Chennai"
  }
  stages{
    stage('User'){
      steps{
        echo " userdefined variable $MYHOME  "
      }
    }
  }
}
```



User defined variables in

- Global level
- stage level
- script level

Global level

```
pipeline{
  agent any
  environment{
    MYHOME="Chennai"
  }
  stages{
    stage('User'){
      steps{
        echo " userdefined variable $MYHOME "
      }
    }
  }
}
```

Stage level

```
pipeline{
  agent any
  stages{

    stage('User'){
      environment{
        MYHOME="Chennai"
      }
      steps{
        echo " userdefined variable $MYHOME "
      }
    }
  }
}
```


Script level

```
pipeline{
  agent any
  stages{

    stage('User'){

      steps{
        script{
          MYHOME="Chennai"

        }
        echo " userdefined variable $MYHOME  "
      }
    }
  }
}
```

```
pipeline{
  agent any
  stages{

    stage('User'){

      steps{
        script{
          MYHOME="Chennai"
          echo " userdefined variable $MYHOME  "
        }
      }
    }
  }
}
```

Scope of the Variables : priority order first (script),second(stage),third(global or root)

if you defined the same variable in global ,stage and , it will pick up stage.

```
pipeline{
  agent any
  environment{
    MYHOME="Chennai"
  }
  stages{

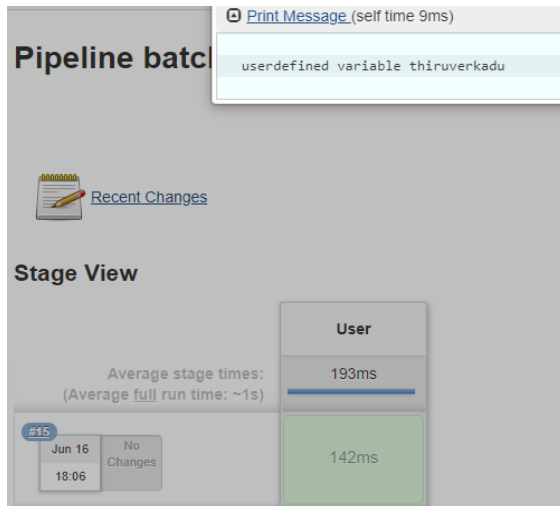
    stage('User'){
      environment{
        MYHOME="thiruverkadu"
      }
    }
  }
}
```

```

    }
    steps{
        echo " userdefined variable $MYHOME "
    }
}
}
}
}

```

O/P



Predefined vs user defined values:

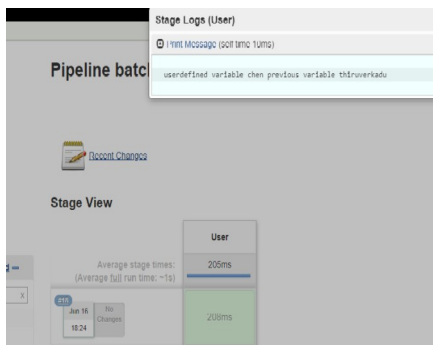
if you defined diff values in variable , we can call above stage variable by `${env.variablename}`

```

pipeline{
    agent any
    environment{
        MYHOME="Chennai"
    }
    stages{

        stage('User'){
            environment{
                MYHOME="thiruverkadu"
            }
            steps{
                script{
                    MYHOME="chen"
                }
                echo " userdefined variable $MYHOME previous variable ${env.MYHOME} "
            }
        }
    }
}
}
}
}

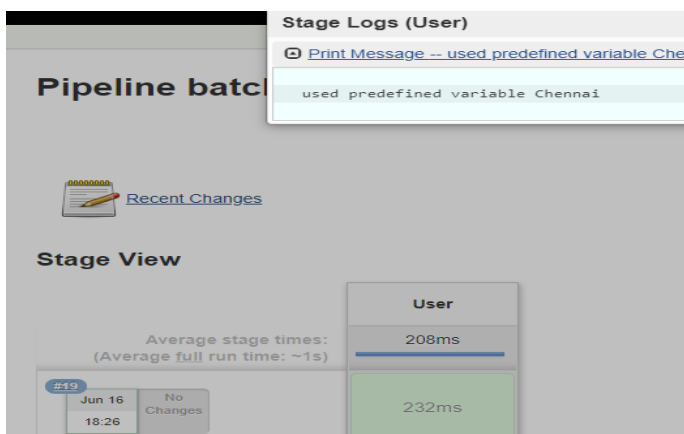
```



Eventhough it predefined variable if we change for custom, priority for user defined

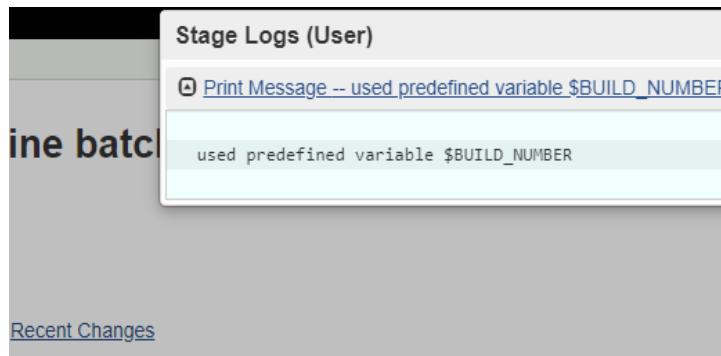
```
pipeline{
  agent any
  environment{
    BUILD_NUMBER="Chennai"
  }
  stages{

    stage("User"){
      environment{
        MYHOME="thiruverkadu"
      }
      steps{
        script{
          MYHOME="chen"
        }
        echo " used predefined variable $BUILD_NUMBER "
      }
    }
  }
}
```

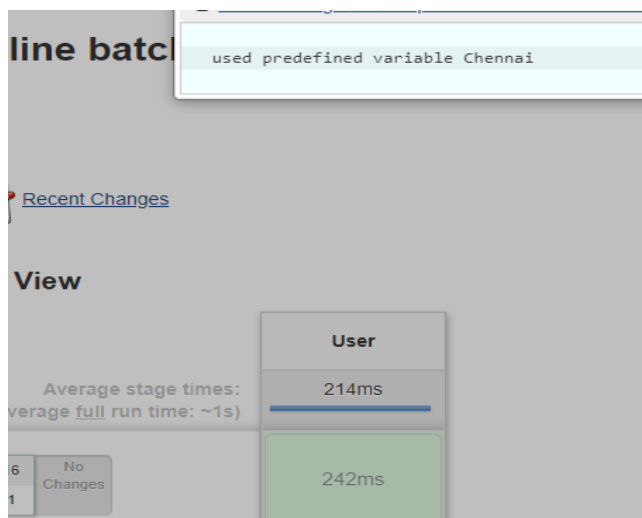


Diff B/W Single and Double quotes

if we defined in single quote it will take as string



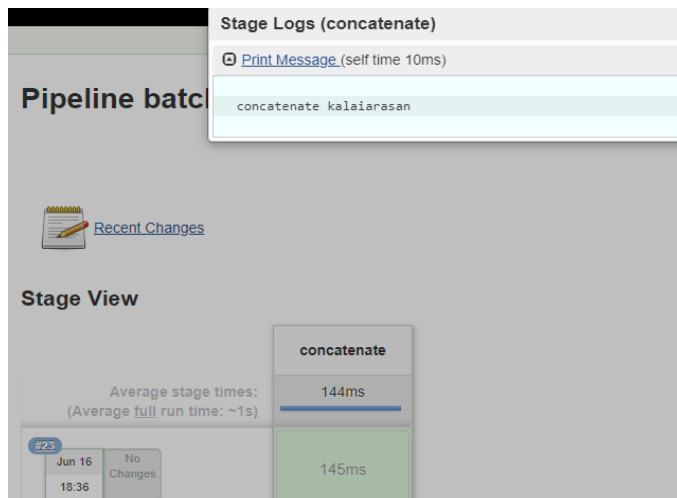
If we defined in double quotes, it will take as variable name



Concatenate

process of combining two or more string by '+' operator in jenkins

```
pipeline{
  agent any
  environment{
    name1="kalai"
    name2='arasan'
  }
  stages{
    stage('concatenate'){
      steps{
        script{
          Name= name1 + name2
        }
        echo " concatenate $Name"
      }
    }
  }
}
```



PARAMETERS

Parameters :

Are used to pass the data dynamically

- ❖ String
- ❖ Text
- ❖ Boolean
- ❖ Choice
- ❖ Password
- ❖ File
- ❖ Dry Run

Syntax:

\$VARIABLENAME and **params. VARIABLENAME** is same.

```
pipeline{
  agent any
  parameters {
    string(name: 'DEPLOY_ENV', defaultValue: 'staging', description: ")
    text(name: 'DEPLOY_TEXT', defaultValue: 'One\nTwo\nThree\n', description: ")
    booleanParam(name: 'TOGGLE', defaultValue: true, description: 'Toggle this value')
    choice(name: 'CHOICE', choices: ['One', 'Two', 'Three'], description: 'Pick something')
    file(name: 'FILE', description: 'Some file to upload')
    password(name: 'PASSWORD', defaultValue: 'SECRET', description: 'A secret password')
```

```

}

stages{
  stage('string'){

    steps{
      echo " string $DEPLOY_ENV"
    }
  }

  stage('text'){

    steps{
      echo " text $DEPLOY_TEXT"
    }
  }

  stage('booleanParam'){

    steps{

      script{
        if(TOGGLE){
          echo " now execute, booleann is true"
        }else{
          echo " Dont execute, boolean is true"
        }
      }
    }
  }

  stage('choice'){

    steps{

      script{
        if(DEPLOY_ENV=='staging'){
          echo " choice $CHOICE"
        }
      }
    }
  }

  stage('file'){

    steps{
      echo " file $FILE"
    }
  }

  stage('password'){

    steps{
      echo " password $PASSWORD"
    }
  }
}
}

```

O/P

Stage View

	string	text	booleanParam	choice	file	password
Average stage times: (Average full run time: ~2s)	97ms	92ms	293ms	91ms	120ms	83ms
#15 Jun 16 19:36 No Changes	177ms	56ms	131ms	120ms	67ms	73ms

Dryrun

Dryrun is mainly used for first time of parameter build, before getting build with parameter.

```

2 agent any
3 * parameters {
4     choice(name: 'DryRun', choices:"Yes\nNo", description: "Do you need dry run?" )
5     string(name: 'PERSON', defaultValue: 'Mr Jenkins', description: 'Who should I say hel
6     text(name: 'BIOGRAPHY', defaultValue: '', description: 'Enter some information about t
7 }
8 * stages {
9     stage("parameterizing") {
10         steps {
11             script {
12                 if ("${params.DryRun}" == "Yes") {
13                     currentBuild.result = 'ABORTED'
14                     error('DRY RUN COMPLETED. JOB PARAMETERIZED.')
15                 }
16             }
17             echo "${PERSON}"
18         }
19     }
20 }

```

OPTION SET

❖ Options

- ❖ retry
- ❖ buildDiscarder
- ❖ disableconcurrentbuild
- ❖ timeout: timestamps

Options stage level or pipe level

- Retry: before failing the job, will run the job again to specified times
- buildDiscarder : used to delete old build logs in number or days
- disableConcurrentBuilds: used to disable concurrent build

- Timeout: Time set for particular build
- timestamp: will add the time to the build process

Retry Stage based

```
pipeline {
  agent any
  stages {
    stage('Deploy') {
      options {
        retry(3)

        timeout(time: 5, unit: 'SECONDS')
      }
      steps {

        sh 'echo hello'
        sleep(10)

      }
    }
  }
}
```

Retry: step based

```
pipeline {
  agent any
  stages {
    stage('Deploy') {
      steps {
        retry(3) {
          sh 'echo hello'
        }
      }
    }
  }
}
```

Retry: global based

```
pipeline {
  agent any
  options {
    retry(3)
  }
  stages {
    stage('Deploy') {
```



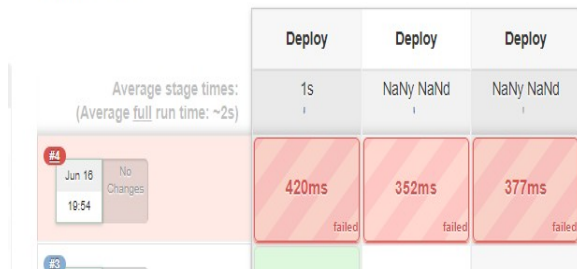
```

    steps {
        sh 'echo hello'
    }
}

```

if any error or timeout it will execute 3 times

Stage View



buildDiscarder

- numbers: options { buildDiscarder(logRotator(numToKeepStr: '5')) }
- days: options { buildDiscarder(logRotator(daysToKeepStr: '7')) }

```

pipeline {
    agent any
    options { buildDiscarder(logRotator(numToKeepStr: '5')) }

    stages {
        stage('Deploy') {

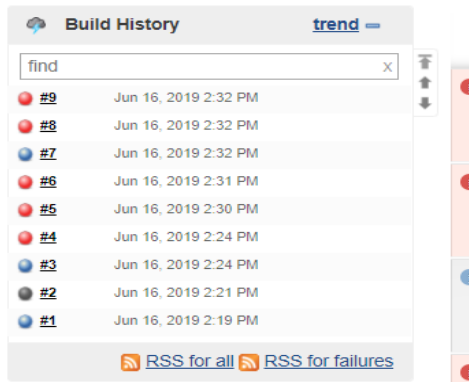
            steps {

                sh 'echo hello'

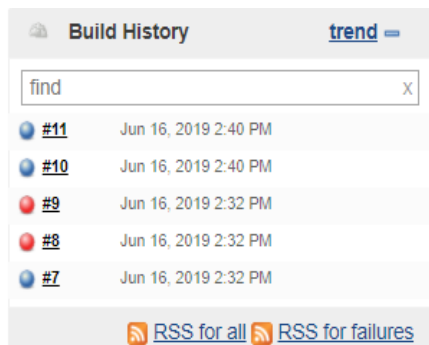
            }
        }
    }
}

```

before : buildDiscarder execution



After : buildDiscarder execution



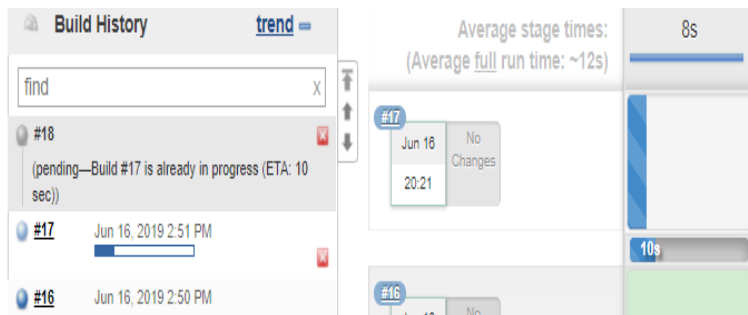
disableConcurrentBuilds

if execute the build if it takes time to complete again parallelly , we trigger b4 complete the previous build, again build get start to execute, due to this job will get conflicts with nodes.

```

pipeline {
  agent any
  options {
    buildDiscarder(logRotator(numToKeepStr: '5'))
    disableConcurrentBuilds()
  }
  stages {
    stage('Deploy') {
      steps {
        sh 'echo hello'
        sleep(10)
      }
    }
  }
}

```



Timeout:

`timeout(time: 30, unit: 'MINUTES')`

`timeout(time: 30, unit: 'SECONDS')`

`timeout(time: 30, unit: 'HOURS')`

Syntax

```
pipeline {
  agent any
  options {
    buildDiscarder(logRotator(numToKeepStr: '5'))
    disableConcurrentBuilds()
    timeout(time: 5, unit: 'SECONDS')
  }
  stages {
    stage('Deploy') {
      steps {
        sh 'echo hello'
        sleep(10)
      }
    }
  }
}
```

its aborted after the timelimit

Console Output

```
Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/retry
[Pipeline] {
[Pipeline] timeout
Timeout set to expire in 5 sec
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] sh
+ echo hello
hello
[Pipeline] sleep
Sleeping for 10 sec
Cancelling nested steps due to timeout
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // timeout
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Timeout has been exceeded
Finished: ABORTED
```

Timeout Stage based:

```
pipeline {
  agent any

  stages {
    stage('Deploy') {
      options {
        retry(3)

        timeout(time: 5, unit: 'SECONDS')
      }
      steps {
        sh 'echo hello'

        sleep(10)
      }
    }
  }
}
```

Timestamp:

```
pipeline {
  agent any
  options {
    buildDiscarder(logRotator(numToKeepStr: '5'))
    disableConcurrentBuilds()
    timestamps()
  }
  stages {
    stage('Deploy') {
      steps {
        sh 'echo hello'
        sleep(2)
        sh 'echo hi'
        sleep(2)
      }
    }
  }
}
```

```

    sh 'echo how'
  }
}
}

```

With timestamp

Console Output

```

Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on jenkins in /var/jenkins_home/workspace/retry
[Pipeline] {
[Pipeline] timestamps
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] sh
20:38:26 + echo hello
20:38:26 hello
[Pipeline] sleep
20:38:26 Sleeping for 2 sec
[Pipeline] sh
20:38:28 + echo hi
20:38:28 hi
[Pipeline] sleep
20:38:28 Sleeping for 2 sec
[Pipeline] sh
20:38:30 + echo how
20:38:30 how
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // timestamps
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

Without timestamp

Console Output

```

Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on jenkins in /var/jenkins_home/workspace/retry
[Pipeline] {
[Pipeline] timeout
Timeout set to expire in 5 sec
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] sh
+ echo hello
hello
[Pipeline] sleep
Sleeping for 10 sec
Cancelling nested steps due to timeout
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // timeout
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Timeout has been exceeded
Finished: ABORTED

```

TRIGGER BUILDS

❖ Build Triggers

- ❖ Trigger jobs from Pipeline script
- ❖ How to trigger second build, even first build fails
- ❖ How to change build result
- ❖ Call a job by passing parameters

Trigger Other Jobs

- we used build('jobname') option

syntax

```
pipeline {  
  agent any  
  
  stages {  
    stage('triggerjob') {  
      steps {  
  
        build('job1')  
        build('job2')  
      }  
    }  
  }  
}
```

O/P

Console Output

```
Started by user kalai  
Running in Durability level: MAX_SURVIVABILITY  
[Pipeline] Start of Pipeline  
[Pipeline] node  
Running on Jenkins in /var/jenkins_home/workspace/retry  
[Pipeline] {  
[Pipeline] stage  
[Pipeline] { (triggerjob)  
[Pipeline] build (Building job1)  
Scheduling project: job1  
Starting building: job1 #1  
[Pipeline] build (Building job2)  
Scheduling project: job2  
Starting building: job2 #1  
[Pipeline] }  
[Pipeline] // stage  
[Pipeline] }  
[Pipeline] // node  
[Pipeline] End of Pipeline  
Finished: SUCCESS
```

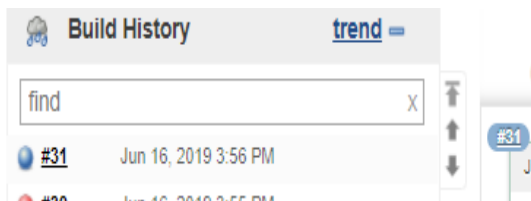
Trigger second job even first job fails

if we triggering two job, if first job got failed, it wont trigger the second job.so we gng say `propagate:false`, so even though job failed, second job will get trigger.

```
pipeline {
  agent any

  stages {
    stage('triggerjob') {
      steps {
        build(job:'job1', propagate:false)
        build('job2')
      }
    }
  }
}
```

even though job1 failed, its showing succes status.



change build result

while using the below function, it will store the status in jobresult, now eventhough job failed, it will run triffer both job, but it will show unstable result status

```
jobresult = build(job:'jobname', propagate:false).result
```

syntax

```
pipeline {
  agent any

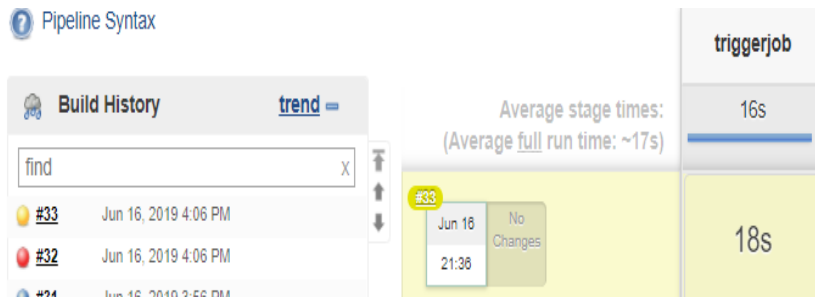
  stages {
    stage('triggerjob') {
      steps {
        script{
          jobresult = build(job:'job1', propagate:false).result
          build('job2')
          if(jobresult=='FAILURE'){
            currentBuild.result='UNSTABLE'
          }
        }
      }
    }
  }
}
```

```

    }
  }
}

```

O/P



Trigger other job with parameters

Already job is created, it contains parameter data to build job

Running job pipeline script

```

pipeline {
  agent any
  parameters {
    choice(
      name: 'Nodes',
      choices:"Linux\nMac",
      description: "Choose Node!")
    choice(
      name: 'Versions',
      choices:"3.4\n4.4",
      description: "Build for which version?" )
    string(
      name: 'Path',
      defaultValue:"/home/pencillr/builds/",
      description: "Where to put the build!")
  }
  stages {
    stage("build") {
      steps {
        script {

          echo "$Nodes"
          echo "Versions"
          echo "Path"

        }
      }
    }
  }
}

```


triggering job pipeline script:

```
pipeline {
  agent any

  stages {
    stage("build") {
      steps {
        script {

          build(job: "builder-job",
            parameters:
            [string(name: 'Nodes', value: "Linux"),
            string(name: 'Versions', value: "3.4"),
            string(name: 'Path', value: "/home/pencillr/builds/{")])

        }
      }
    }
  }
}
```

Schedule Jobs



Cron - trigger job will run depends up the cron schedule

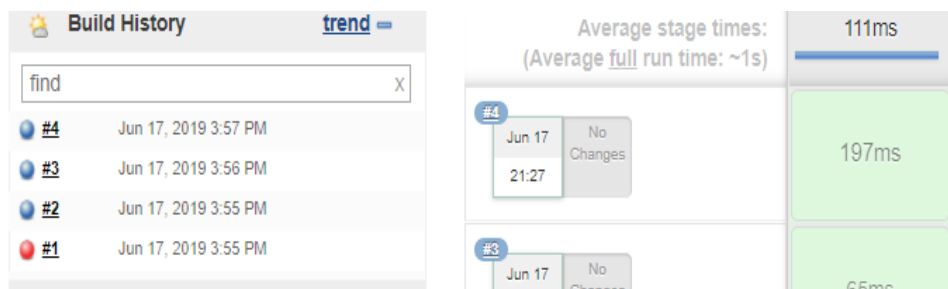
```
pipeline {
  agent any
  options{
    timestamps()
  }
  triggers{
    cron('* * * * *')
  }
  stages {
    stage("cron") {
      steps {
```

```

        echo "heloo"
    }
}
}

```

job is running every min



Poll SCM- will trigger the job depends up the changes in code, if there is no commit it wont run.

```

pipeline {
    agent any
    options {
        timestamps()
    }
    triggers {
        pollSCM('* * * * *')
    }
    stages {
        stage("cron") {
            steps {
                echo "heloo"
                git url:"https://github.com/kalaiarasan33/public.git"
            }
        }
    }
}

```

Pipeline poll

Recent Changes

Stage View

Average stage times:
(Average full run time: ~5s)

Jun 17 21:31 No Changes

```

Print Message -- heloo (self time 14ms)
Git -- https://github.com/kalaiarasan33/public.git (self time 4s)

21:31:29 No credentials specified
21:31:29 Cloning the remote Git repository
21:31:29 Cloning repository https://github.com/kalaiarasan33/public.git
21:31:29 > git init /var/jenkins_home/workspace/poll # timeout=10
21:31:30 Fetching upstream changes from https://github.com/kalaiarasan33/public.git
21:31:30 > git --version # timeout=10
21:31:30 > git fetch --tags --progress https://github.com/kalaiarasan33/public.git
s/remotes/origin/*
21:31:32 > git config remote.origin.url https://github.com/kalaiarasan33/public.git
21:31:32 > git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/*
21:31:32 > git config remote.origin.url https://github.com/kalaiarasan33/public.git
21:31:32 Fetching upstream changes from https://github.com/kalaiarasan33/public.git
21:31:32 > git fetch --tags --progress https://github.com/kalaiarasan33/public.git
s/remotes/origin/*
21:31:33 > git rev-parse refs/remotes/origin/master^{commit} # timeout=10
21:31:33 > git rev-parse refs/remotes/origin/origin/master^{commit} # timeout=10
21:31:33 Checking out Revision 56cbe485e5855ea202ec7c850ca5af47a5c3defd (refs/remotes/origin/master)
21:31:33 > git config core.sparsecheckout # timeout=10
21:31:33 > git checkout -f 56cbe485e5855ea202ec7c850ca5af47a5c3defd

```

Parallel

- ❖ Parallel:
 - ❖ Can I use multiple steps under same stage?
 - ❖ How to execute jobs at same time ?
 - ❖ How to execute stages parallel
 - ❖ What is the use of FailFast

Multiple steps sections under same stage

No we cant use multiple steps in same stage.like below

```

stages {
    stage("cron") {
        steps {
            echo "step1"
        }
        steps {
            echo "step2"
        }
    }
}

```

Parallel builds -- it will trigger the build parallely

```
pipeline {
```

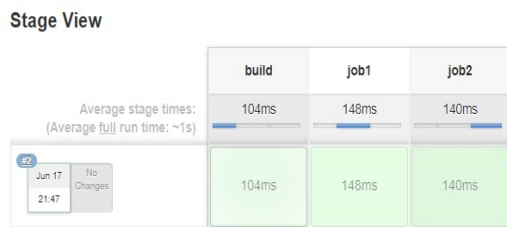
```

agent any

stages {
    stage("build") {
        parallel {
            stage('job1'){
                steps{
                    echo "job1"
                }
            }
            stage('job2'){
                steps{
                    echo "job2"
                }
            }
        }
    }
}

```

build Job is triggering parallelly



Parallel stages:

```

pipeline {
    agent any
    options{
        timestamps()
    }

    stages {
        stage("stage1") {
            parallel{
                stage('stage1job1'){
                    steps{
                        echo "stage1job1"
                        sleep(10)
                    }
                }
                stage('stage1job2'){

```

O/P of parallel build

failFast

29 Jenkins Pipeline by Kalaiarasan

```

pipeline {
  agent any
  options{
    timestamps()
  }

  stages {
    stage("stage1") {
      failFast true
      parallel{
        stage('stage1job1'){
          steps{
            echo "stage1job1"
            sleep(10)
          }
        }
        stage('stage1job2'){
          steps{
            eecho "stage1job2"
            sleep(10)
          }
        }
      }
    }
    stage('stage2job1'){
      steps{
        echo "stage2job1"
        sleep(5)
      }
    }
    stage('stage2job2'){
      steps{
        echo "stage2job2"
        sleep(5)
      }
    }
  }
}

```

Stage View

Average stage times:
(Average full run time: ~11s)

	stage1	stage1job1	stage1job2	stage2job1	stage2job2
Average	129ms	3s	2s	1s	1s
#13 Jun 17 22:20 No Changes	132ms	622ms	396ms	568ms	553ms
		aborted	failed	aborted	aborted
#12					

POST JOBS

post will execute after the completion of pipeline's stages section contains the following blocks

❖ POST :

- ❖ Always
- ❖ Changed
- ❖ Fixed
- ❖ Regression
- ❖ Aborted
- ❖ Failure
- ❖ Success

❖ POST blocks cont...

- ❖ Unstable
- ❖ Unsuccessful
- ❖ Cleanup

Post stage and stages level

Always : Runs always, wont depend upon the build result

changed: Runs only if current build status is changed when compare to previous

Fixed: current status is success and previous status is failed

Regression: if current status is fail/unstable/aborted and previous run is successful.

Aborted: if the current status is aborted

Failure : Runs only if the current build status is failed.

Success : current build is success

Unstable : current build is unstable

cleanup : like always, will execute at every time in the last (if you want to delete any workspace and cleaup any folder , we can use this)

```

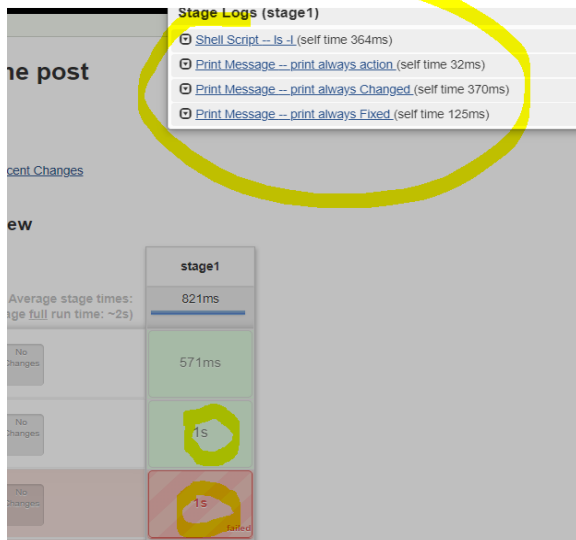
pipeline {
    agent any
    options{
        timestamps()
    }

    stages {
        stage("stage1") {
            steps{
                sh "ls -l"
            }
            post{
                always{
                    echo " action  always "
                }
                changed{
                    echo " action always Changed from previous state"
                }
                fixed{
                    echo " action  Fixed when previous state is failure"
                }
                regression{
                    echo " action when current state is fail/unstable/aborted , previous state is
success"
                }
                aborted{
                    echo " action always aborted"
                }
                failure{
                    echo " action always failure"
                }
                success{
                    echo " action always success"
                }
                unstable{
                    echo " action  unstable"
                }
                cleanup{
                    echo " action similar like always , it is using to cleanup folder or
workspace"
                }
            }
        }
    }
}

```

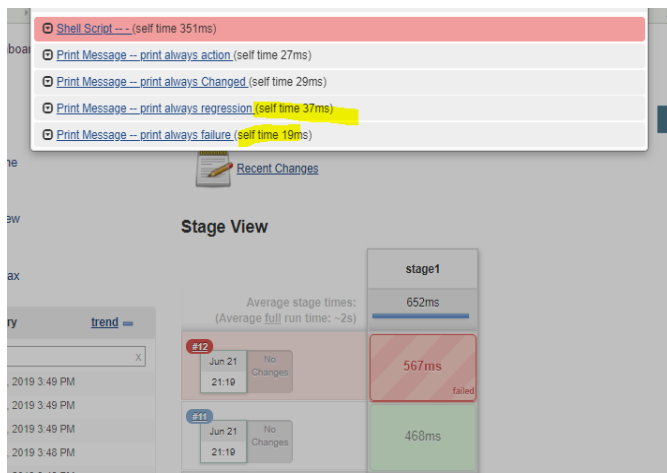
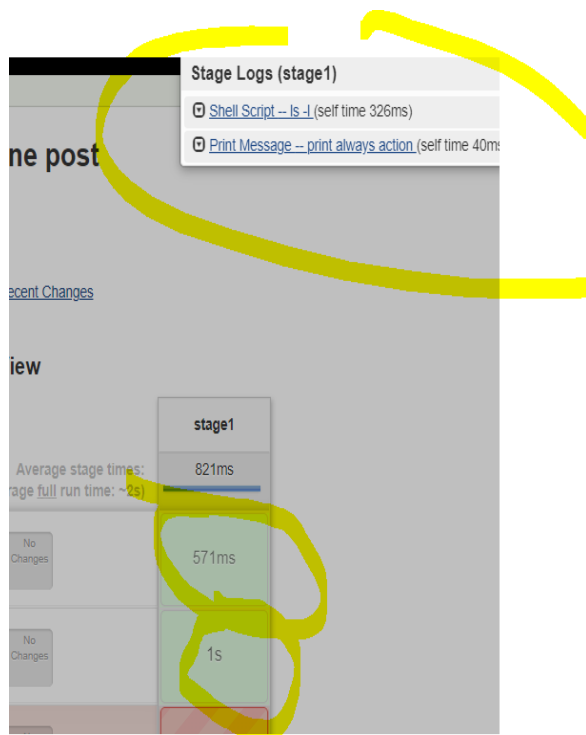

Previous build is failed, current build success O/P.

So Always , change (changes in state from previous state), fixed (previous build failed, current passed), all executed



Previous build is success O/P

So always only executed, there no action for change and fixed



Console Output

Started by user [kalai](#)
 Running in Durability level: MAX_SURVIVABILITY
 [Pipeline] Start of Pipeline
 [Pipeline] node
 Running on [Jenkins](#) in /var/jenkins_home/workspace/post
 [Pipeline] {
 [Pipeline] timestamps
 [Pipeline] {
 [Pipeline] stage
 [Pipeline] { (stage1)
 [Pipeline] sh
 21:21:58 + ls
 [Pipeline] sleep
 21:21:58 Sleeping for 5 sec
 Aborted by [kalai](#)
 Post stage
 [Pipeline] echo
 21:22:00 print always action
 [Pipeline] echo
 21:22:00 print always Changed
 [Pipeline] echo
 21:22:00 print always regression
 [Pipeline] echo
 21:22:00 print always aborted
 [Pipeline] }
 [Pipeline] // stage
 [Pipeline] }
 [Pipeline] // timestamps
 [Pipeline] }
 [Pipeline] // node
 [Pipeline] End of Pipeline
 Finished: ABORTED

in text

TOOLS

If you want to run specific version of tools to use in pipeline for specific job, so we using tools.

Ex: maven in two version

Maven installations

☐ Maven

Name

☒ Install automatically

☐ Install from Apache

Version

☐ Maven

Name

☒ Install automatically

☐ Install from Apache

Version

```
pipeline{
  agent any
  tools{
    maven 'Maven3.6.1'
  }
  stages{
    stage('tools_version'){
      steps{
        sh 'mvn --version'
      }
    }
  }
}
```

O/P

Console Output

```
Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/Tools
[Pipeline] { (hide)
[Pipeline] stage
[Pipeline] { (Declarative: Tool Install)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] }
[Pipeline] // stage
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (tools_version)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ mvn --version
Apache Maven 3.6.1 (d66c9c8b3152b2e69ee9bac180bb8fcc8e6af555; 2019-04-04T19:00:29Z)
Maven home: /var/jenkins_home/tools/hudson.tasks.Maven_MavenInstallation/Maven3.6.1
Java version: 1.8.0_212, vendor: Oracle Corporation, runtime: /usr/local/openjdk-8/jre
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "4.15.0-51-generic", arch: "amd64", family: "unix"
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Different version maven in job

```
pipeline{
  agent any
  tools{
    maven 'Maven3.5.0'
  }
  stages{
    stage('tools_version'){
      steps{
        sh 'mvn --version'
      }
    }
  }
}
```

Console Output

```
Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/Tools
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Tool Install)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] }
[Pipeline] // stage
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (tools_version)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ mvn --version
Apache Maven 3.5.0 (ff8f5e7444045639af65f6095c62210b5713f426; 2017-04-03T19:39:06Z)
Maven home: /var/jenkins_home/tools/hudson.tasks.Maven_MavenInstallation/Maven3.5.0
Java version: 1.8.0_212, vendor: Oracle Corporation
Java home: /usr/local/openjdk-8/jre
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "4.15.0-51-generic", arch: "amd64", family: "unix"
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Tools in Stage level :

```
pipeline{
  agent any
  tools{
    maven 'Maven3.6.1'
  }
  stages{
    stage('tools_version'){
      steps{
        sh 'mvn --version'
      }
    }
    stage('diff_version_stage_level'){
      tools{
        maven 'Maven3.5.0'
      }
      steps{
        echo "stage level"
        sh 'mvn --version'
      }
    }
  }
}
```

```

Running on Jenkins in /var/jenkins_home/workspace/Tools
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Tool Install)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] }
[Pipeline] // stage
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (tools_version)
[Pipeline] tool
[Pipeline] envVarsForTool (hide)
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ mvn --version
Apache Maven 3.6.1 (d66c9c0b3152b2e69ee9bac190bb8fcc8e6af555; 2019-04-04T19:00:29Z)
Maven home: /var/jenkins_home/tools/hudson.tasks.Maven_MavenInstallation/Maven3.6.1
Java version: 1.8.0_212, vendor: Oracle Corporation, runtime: /usr/local/openjdk-8/jre
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "4.15.0-51-generic", arch: "amd64", family: "unix"
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (diff_version_stage_level)
[Pipeline] tool
[Pipeline] envVarsForTool
[Pipeline] withEnv
[Pipeline] {
[Pipeline] echo
stage level
[Pipeline] sh
+ mvn --version
Apache Maven 3.5.0 (ff8f5e7444045639af65f6095c62210b5713f426; 2017-04-03T19:39:06Z)
Maven home: /var/jenkins_home/tools/hudson.tasks.Maven_MavenInstallation/Maven3.5.0
Java version: 1.8.0_212, vendor: Oracle Corporation
Java home: /usr/local/openjdk-8/jre
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "4.15.0-51-generic", arch: "amd64", family: "unix"
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

Conditional and Loop Statements

IF Condition:

We can use Groovy coding functionalities using script {...} section.

```

pipeline {
  agent any
  environment {
    Tools='Jenkins'
  }
  stages {
    stage('conditions'){
      steps {
        script {
          if(Tools == 'Jenkins'){
            echo 'Tools is jenkins'
          }else{
            echo 'Tools is not jenkins '
          }
        }
      }
    }
  }
}

```

```

    }
  }
}

```

Console Output

```

Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on jenkins in /var/jenkins_home/workspace/Tools
[Pipeline] {
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (conditions)
[Pipeline] script
[Pipeline] {
[Pipeline] echo
Tools is jenkins
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

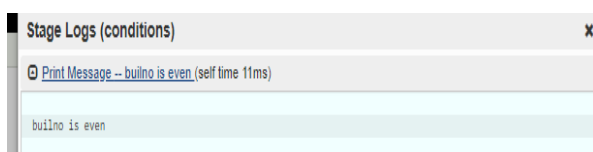
```

Demo : check build number even or Odd

```

pipeline{
  agent any
  environment{
    Tools='Jenkins'
  }
  stages{
    stage('conditions'){
      steps{
        script{
          int buildno="$BUILD_NUMBER"
          if(buildno %2 == 0){
            echo 'builno is even'
          }else{
            echo 'buildno is odd'
          }
        }
      }
    }
  }
}

```



Demo: For loop

```
pipeline{
  agent any
  environment{
    Tools='Jenkins'
  }
  stages{
    stage('conditions'){
      steps{
        script{
          for(i=0;i<=5;i++){
            println i
          }

          int buildno="$BUILD_NUMBER"
          if(buildno %2 == 0){
            echo 'buildno is even'
          }else{
            echo 'buildno is odd'
          }
        }
      }
    }
  }
}
```



Other Example

- ❖ Other examples
 - ❖ Ansi color
 - ❖ Change BuildName and Description
 - ❖ Dir, cleanws
 - ❖ Write file jenkins syntax
 - ❖ Maven example
 - ❖ Archive artifacts
 - ❖ Finger prints

❖ Other examples cont...

- ❖ Credentials
- ❖ Check OS type
- ❖ Trim string

Ansicolor:

we need to install the plugin first , then set the ansi in configuration ,jenkins foreground

```
pipeline{
  agent any
  stages{
    stage('ansi'){
      steps{
        ansiColor('xterm') {
          echo 'something that outputs ansi colored stuff'
        }
      }
    }

    stage('non_ansi'){
      steps{
        echo 'non_ansi'
      }
    }
  }
}
```

Custom color maps

Name	xterm
Default Background	Jenkins Default
Default Foreground	Green
Black	#000000
	#4C4C4C
Red	#CD0000
	#FF0000
Green	#00CD00
	#00FF00
Yellow	#CDCD00
	#####
Blue	#1E90FF
	#4682B4
Magenta	#CD00CD
	#FF00FF
Cyan	#00CDCD
	#####
White	#E5E5E5
	#####

Console Output

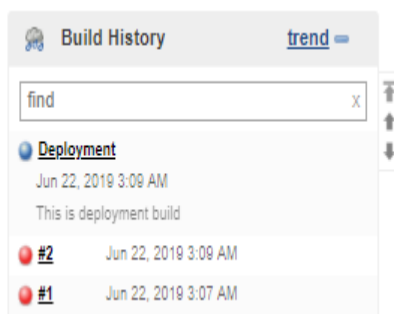
```
Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/Example/ansi
[Pipeline] {
[Pipeline] stage
[Pipeline] { (ansi)
[Pipeline] ansiColor
[Pipeline] {
[Pipeline] echo
Something that outputs ansi colored stuff
[Pipeline] }
[Pipeline] // ansiColor
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (non_ansi)
[Pipeline] echo
non_ansi
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Change Build Number to Name

This is used to define the name for the job and description.

```
pipeline{
  agent any
  stages{
    stage('buid_name'){
      steps{
        script{
          currentBuild.displayName = "Deployment"
          currentBuild.description = "This is deployment build"
        }
        echo 'build name changing'
      }
    }
  }
}
```

O/P



dir, cleanws

create folder inside workspace -> job name -> (creating folder) -> job output is here

```
kalai@jenlinux:~/jenkins_home/workspace/Example$ cd delete_ws/ --> job name
kalai@jenlinux:~/jenkins_home/workspace/Example/delete_ws$ ls
build_one build_one@tmp --> folder we created with dir function
kalai@jenlinux:~/jenkins_home/workspace/Example/delete_ws$ cd build_one
kalai@jenlinux:~/jenkins_home/workspace/Example/delete_ws/build_one$ ls
hello.txt --> output created
kalai@jenlinux:~/jenkins_home/workspace/Example/delete_ws/build_one$ pwd
/home/kalai/jenkins_home/workspace/Example/delete_ws/build_one
```

Creating output in workspace -> jobname -> build_one --> outputfiles

```
pipeline{
  agent any
  stages{
    stage('cleanWS'){
      steps{
        dir('build_one'){
          script{
            currentBuild.displayName = "Deployment"
            currentBuild.description = "This is deployment build"
          }
          sh "echo dir creation and delete WS > hello.txt"
        }
      }
    }
  }
}
```

Creating output in workspace -> jobname -> build_one --> outputfiles --> deleted job workspace

```
kalai@jenlinux:~/jenkins_home/workspace/Example/delete_ws/build_one/..$ cd ..
kalai@jenlinux:~/jenkins_home/workspace/Example$ ls
change_build_name change_build_name@tmp
kalai@jenlinux:~/jenkins_home/workspace/Example$
```

```
pipeline{
  agent any
  stages{
    stage('cleanWS'){
      steps{
        dir('build_one'){
          script{
            currentBuild.displayName = "Deployment"
            currentBuild.description = "This is deployment build"
          }
          sh "echo build name changing > hello.txt"
        }
        cleanWs()
      }
    }
  }
}
```

```

    }
  }
}

```

Console Output

```

Started by user kala
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on jenkins in /var/jenkins_home/workspace/Example/delete_ws
[Pipeline] {
[Pipeline] stage
[Pipeline] { (cleanWS)
[Pipeline] dir
Running in /var/jenkins_home/workspace/Example/delete_ws/build_one
[Pipeline] {
[Pipeline] script
[Pipeline] {
[Pipeline] }
[Pipeline] // script
[Pipeline] sh
+ echo build name changing
[Pipeline] }
[Pipeline] // dir
[Pipeline] cleanWS
[WS-CLEANUP] Deleting project workspace...
[WS-CLEANUP] Deferred wipeout is used...
[WS-CLEANUP] done
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

Write file_Jenkins syntax

Creating file in jenkins syntax

```

pipeline{
  agent any
  stages{
    stage('write_file'){
      steps{

```

```

        writeFile file: 'newfile.txt' , text:"my file content is very small"
        archiveArtifacts '*.txt'

```

```

      }
    }
  }
}

```

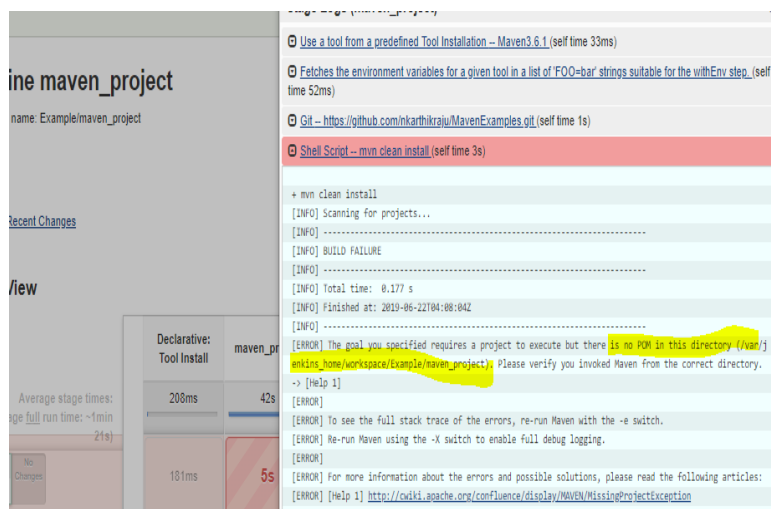


Sample Maven Build

Build the maven project

```
pipeline{
  agent any
  tools{
    maven 'Maven3.6.1'
  }
  stages{
    stage('maven_project'){
      steps{
        git url:'https://github.com/nkarthikraju/MavenExamples.git'
        sh "mvn clean install"
      }
    }
  }
}
```

without moving into the directory , it will show error , no pom file



now moved to directory with help of dir function then executing maven clean install

```
pipeline{
  agent any
  tools{
    maven 'Maven3.6.1'
  }
  stages{
    stage('maven_project'){
      steps{

        git url:"https://github.com/nkarthikraju/MavenExamples.git"
        dir('MavenHelloWorldProject'){
          sh "mvn clean install"
        }
      }
    }
  }
}
```

The screenshot displays the Jenkins Pipeline console output for the 'maven_project' stage. On the left, a summary table shows the stage times: Declarative: Tool Install (183ms) and maven_pr (31s). The main console output shows the following steps and their logs:

- Use a tool from a predefined Tool Installation -- Maven3.6.1** (self time 36ms)
- Fetches the environment variables for a given tool in a list of 'FOO=bar' strings suitable for the withEnv step** (self time 47ms)
- Git -- https://github.com/nkarthikraju/MavenExamples.git** (self time 1s)
- Shell Script -- mvn clean install** (self time 8s)

The shell script output shows the Maven build process:

```
+ mvn clean install
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.jcg.maven:MavenHelloWorldProject >-----
[INFO] Building MavenHelloWorldProject 1.0-SNAPSHOT
[INFO] -----[ jar ]-----
[INFO]
[INFO] --- maven-clean-plugin:2.5:clean (default-clean) @ MavenHelloWorldProject ---
[INFO] Deleting /var/jenkins_home/workspace/Example/maven_project/MavenHelloWorldProject/target
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ MavenHelloWorldProject ---
[WARNING] Using platform encoding (UTF-8 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory /var/jenkins_home/workspace/Example/maven_project/MavenHelloWorldProject/src/main/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ MavenHelloWorldProject ---
[INFO] Changes detected - recompiling the module!
[WARNING] File encoding has not been set, using platform encoding UTF-8, i.e. build is platform dependent
```

Archive artifacts and finger prints

getting archiveArtifacts when build is success



```
pipeline{
  agent any
  tools{
    maven 'Maven3.6.1'
  }
  stages{
    stage('maven_project'){
      steps{
```


```


git url:"https://github.com/nkarthikraju/MavenExamples.git"
dir('MavenHelloWorldProject'){
    sh "mvn clean install"
}
}
post{
    success{
        archiveArtifacts "MavenHelloWorldProject/target/*.jar"
    }
}
}
}

```

Build #14 (Jun 22, 2019 4:17:33 AM)

 [Build Artifacts](#)
 [MavenHelloWorldProject-1.0-SNAPSHOT.jar](#) 2.30 KB [view](#)

 Started by user [kalai](#)

 **Revision:** 2735d422f3e288920748a4223f99b0232d47ce3a
 • refs/remotes/origin/master

Fingerprint:

if we execute the same job 10 times or etc, it will give same name output , for the identification or record the artifacts with fingerprint it will create checksum with build.

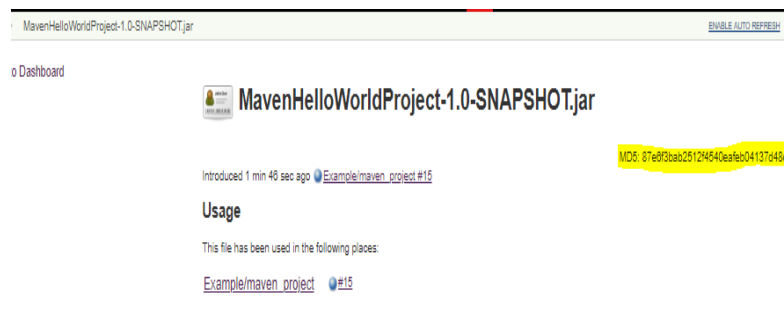
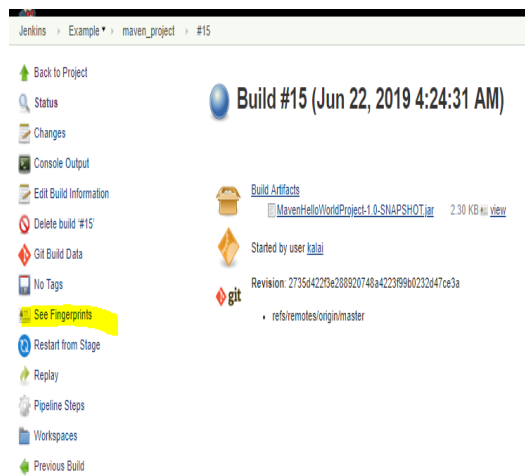
```

pipeline{
  agent any
  tools{
    maven 'Maven3.6.1'
  }
  stages{
    stage('maven_project'){
      steps{

        git url:"https://github.com/nkarthikraju/MavenExamples.git"
        dir('MavenHelloWorldProject'){
          sh "mvn clean install"
        }
      }
    }
  }
  post{
    success{
      archiveArtifacts artifacts:"MavenHelloWorldProject/target/*.jar" , fingerprint:true
    }
  }
}
}
}

```

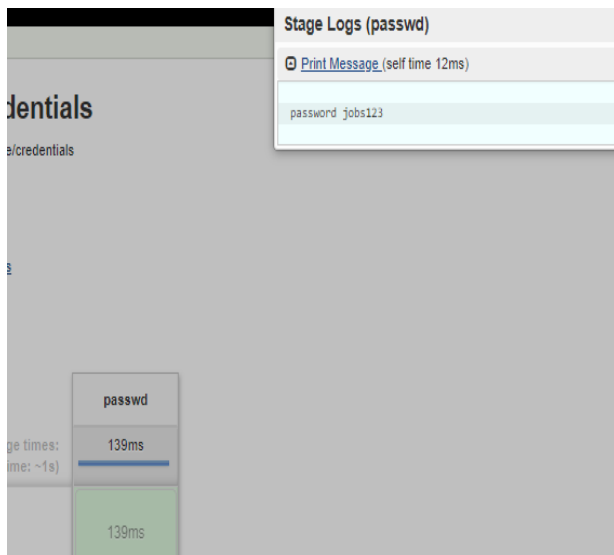
O/P



Uses of Credentials Option

if we pass the password it will transparent

```
pipeline{
  agent any
  environment{
    pass="jobs123"
  }
  stages{
    stage('passwd'){
      steps{
        echo "password $pass"
      }
    }
  }
}
```

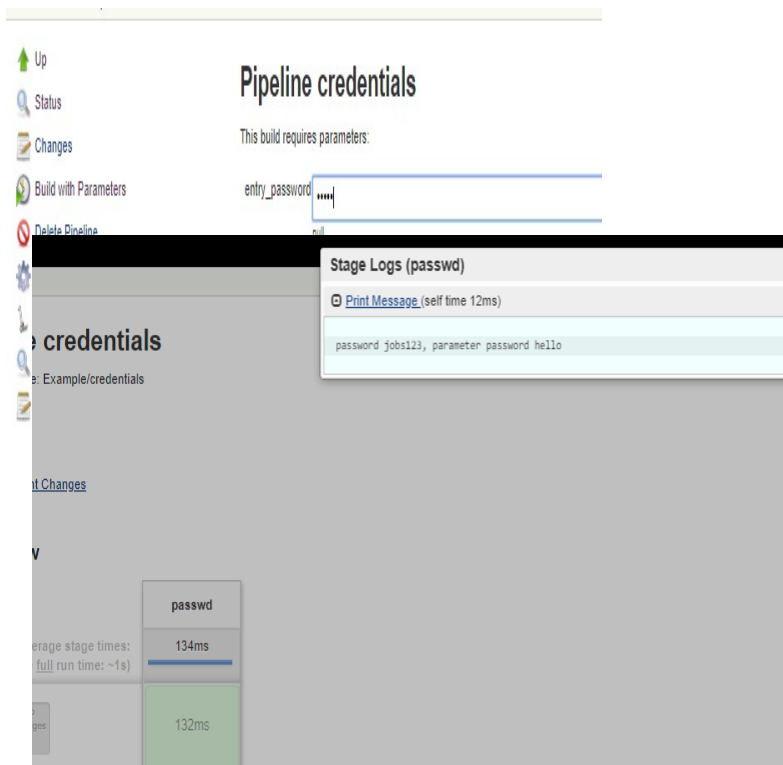
another option passing the password as parameter with (password parameter)

```

pipeline{
  agent any
  environment{
    pass="jobs123"
  }
  parameters{
    password(name:'entry_password')
  }
  stages{
    stage('passwd'){
      steps{
        echo "password $pass, password parameter $entry_password"
      }
    }
  }
}

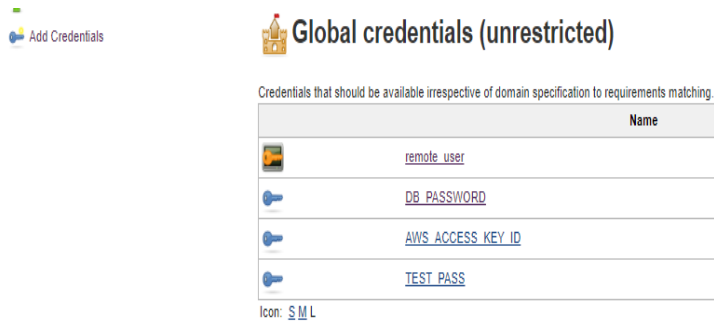
```

O/P

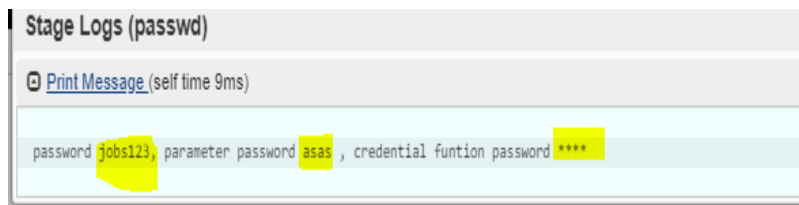


Now password with credential function

create secret text in credentials in jenkins



```
pipeline{
  agent any
  environment{
    pass="jobs123"
    passwod=credentials('DB_PASSWORD')
  }
  parameters {
    password(name:'entry_password')
  }
  stages{
    stage('passwd'){
      steps{
        echo "password $pass, parameter password $entry_password , credential funtion password
$passwod"
      }
    }
  }
}
```



CheckOS_AndExecuteSteps

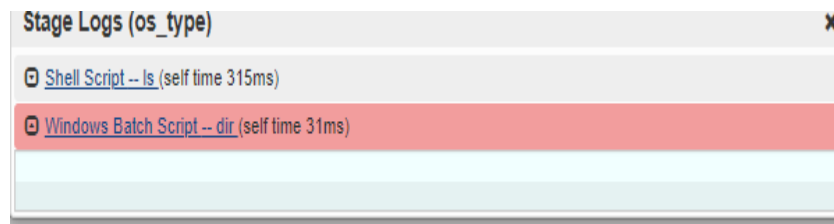
if we execute like below it will show error, so we need to check the os type with of function

```

pipeline{
  agent any

  stages{
    stage('os_type'){
      steps{
        sh "ls"
        bat "dir"
      }
    }
  }
}

```



now it will check the ostype and then it will execute

```

pipeline{
  agent any

  stages{
    stage('os_type'){
      steps{
        script{
          if(isUnix()){
            sh "ls"
          }else{
            bat "dir"
          }
        }
      }
    }
  }
}

```

This is linux machine, so linux command executed



Trim

```
pipeline{
  agent any
  environment{
    tools='jenkins'
  }
  stages{
    stage('trimming_string'){
      steps{
        script{
          t1=tools[0..6] //jenkins
          t2=tools[3..5] //kin
          echo "$t1 , $t2"
        }
      }
    }
  }
}
```



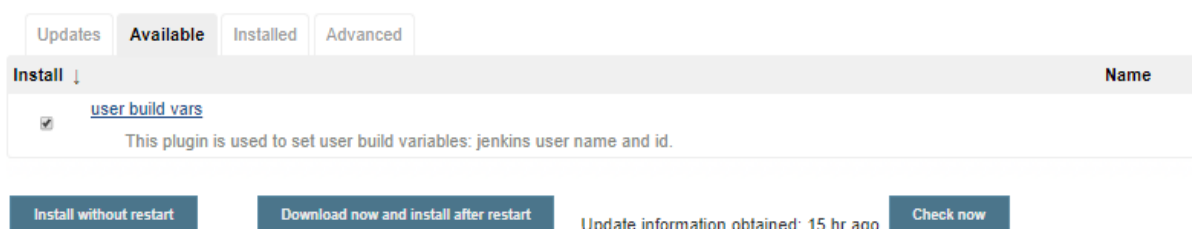
InPut Section

❖ InPut examples

❖ Wait for user input

❖ Wait for specific user to read input

Install the plugin



```

pipeline {
  agent any

  stages {
    stage('build user') {
      steps {
        wrap([$class: 'BuildUser']) {
          sh 'echo "${BUILD_USER}"'
        }
      }
    }
  }
}

```

it will pull the user name



Build in specific user

```

pipeline{
  agent any
  stages{
    stage('user_input'){
      steps{
        wrap([$class: 'BuildUser']){
          script{
            def name1="${BUILD_USER}"
            echo "${BUILD_USER}, $name1"
            if(name1=="kalai"){
              echo "only kalai can able to build"
            }else{
              echo "others cant able to build"
            }
          }
        }
      }
    }
  }
}

```



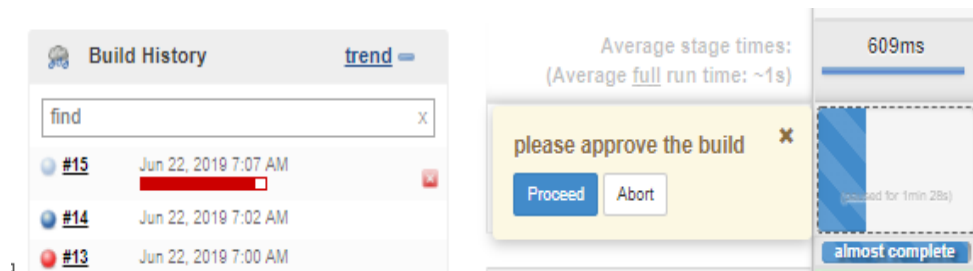
User input proceed or abort

```

pipeline{
    agent any
    stages{
        stage('user_input'){
            steps{
                input("please approve the build")
                script{
                    sh "echo this is kalai"
                }
            }
        }
    }
}

```

user I/P proceed or abort



if proceed it will start

Console Output

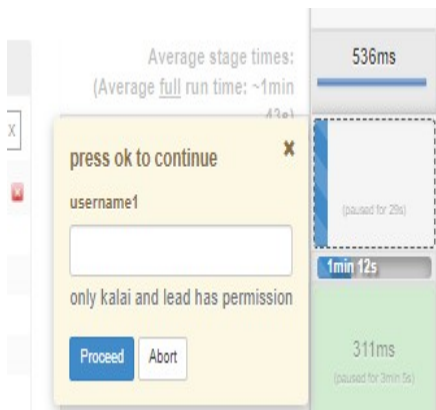
```
started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/Example/user_in
[Pipeline] {
[Pipeline] stage
[Pipeline] { (user_input)
[Pipeline] input
please approve the build
Proceed or Abort
Approved by kalai
[Pipeline] script
[Pipeline] {
[Pipeline] sh
+ echo this is kalai
this is kalai
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Read Input From Specific user:

we can give list of user permission to proceed, other cant give proceed and get specific string from submitter.

```
pipeline{
    agent any
    stages{
        stage('user_input'){
            input{
                message "press ok to continue"
                submitter "kalai,lead"
                parameters{
                    string(name:'username1',description: "only kalai and lead has permission")
                }
            }
            steps{
                echo "User : ${username1} said ok"
            }
        }
    }
}
```

can pass the string:



here is said manager

Console Output

```
Started by user kalai
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/Example/user_in
[Pipeline] {
[Pipeline] stage
[Pipeline] { (user_input)
[Pipeline] input
[Pipeline] input
Input requested
Approved by kalai
[Pipeline] withEnv
[Pipeline] {
[Pipeline] echo
User : manager said ok
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

SCM GIT

We can check out the jenkinsfile in scm whether it is git or SVN.and can maintain with version control.

The screenshot shows the Jenkins Pipeline Syntax view. On the left, there's a 'Build History' section with a search bar containing 'find' and a list of builds. The first build is from Jun 22, 2019 9:28 AM. Below it are links for 'RSS for all' and 'RSS for failures'. In the center, there's a table showing 'Average stage times' and 'Average full run time: ~21s'. The table has two columns: 'Declarative: Checkout SCM' and 'ScenariosFromGIT'. The first row shows '4s' and '384ms' respectively. The second row shows '4s' and '384ms' respectively. Below the table, there's a small table with columns 'Jun 22' and 'No Changes', and a row with '14:59' and 'No Changes'.

GIT checkout with the help of Pipeline syntax option

We can generate the pipeline code from pipeline syntax option

The screenshot shows the Jenkins Pipeline Syntax view. On the left, there's a sidebar with various options: 'Back to Dashboard', 'Status', 'Changes', 'Build Now', 'Delete Pipeline', 'Configure', 'Move', 'Full Stage View', 'Rename', and 'Pipeline Syntax'. The 'Pipeline Syntax' option is highlighted in yellow.

We can generate the pipeline syntax from passing the parameter to plugin , then with generate option

The screenshot shows the Jenkins Pipeline Syntax generator interface. It has an 'Overview' section with a description: 'This Snippet Generator will help you learn the Pipeline Script code which can be used to define various steps. Pick a whole statement into your script, or pick up just the options you care about. (Most parameters are optional and can be c Steps'. Below this is a 'Sample Step' field with the value 'git: Git'. There are fields for 'Repository URL' (https://github.com/nkarthikraju/Jenkins_PL_Examples.git), 'Branch' (master), and 'Credentials' (- none -). There are also checkboxes for 'Include in polling?' and 'Include in changelog?'. A 'Generate Pipeline Script' button is at the bottom. Below the button, the generated pipeline script is shown: 'git \'https://github.com/nkarthikraju/Jenkins_PL_Examples.git\''. The text 'Global Variables' is partially visible at the bottom.

Commit Code

This script will read the file and write and push to the git

```
pipeline{
    agent any
    stages{
        stage('commitcode'){
            steps{
                cleanWs()
                dir('comit_from_jenkins'){
                    git 'https://github.com/kalaiarasan33/jenkins_commit.git'
                    script{
                        oldv=readFile('file.txt')
                        newv=oldv.tpInteger() + 1
                    }
                    writeFile file:"file.txt", text:"$newv"
                    sh """
                        git add file.txt
                        git commit -m "files committed"
                        git push

                    """
                }
            }
        }
    }
}
```

Create tag for every build.

```
pipeline{
    agent any
    stages{
        stage('commitcode'){
            steps{
                git 'https://github.com/kalaiarasan33/jenkins_commit.git'
                dir('tag_jenkins'){
                    sh "git checkout master"
                    sh "git tag Deployment.$BUILD_NUMBER"
                    sh "git push origin Deployment.$BUILD_NUMBER"
                }
            }
        }
    }
}
```

```
}
```

Save Build Numbers which are used for Deployment in the file

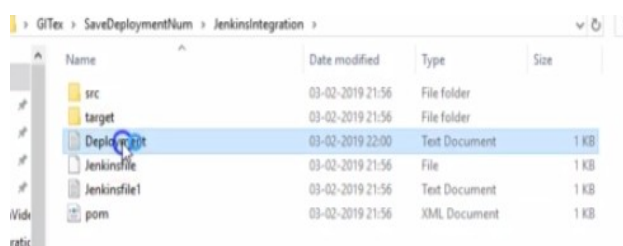
```
pipeline{
    agent any
    stages{
        stage('builnum'){
            steps{
                git 'https://github.com/kalaiarasan33/jenkins_commit.git'
                sh "echo $BUILD_NUMBER >> Deployment.txt"
                dir('save_builnum_jenkins'){

                    sh """
                        git add file.txt
                        git commit -m "updating with build num committed"
                        git push
                    """

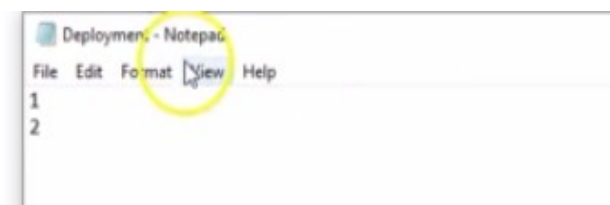
                }
            }
        }
    }
}
```

O/P

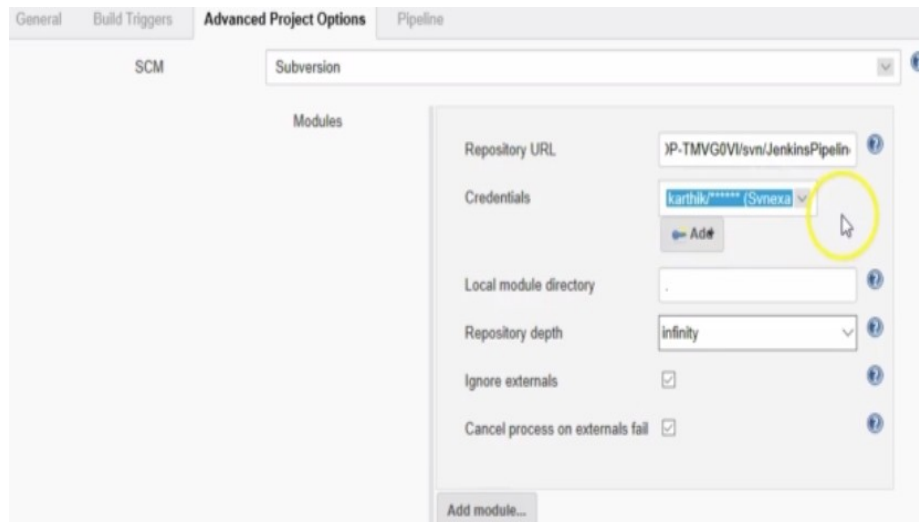
Buid no will add in the deployment file



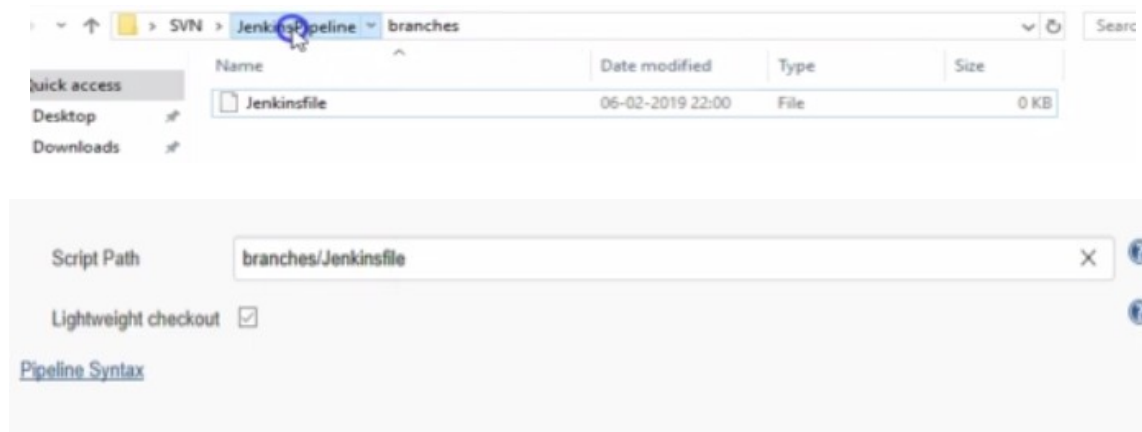
Name	Date modified	Type	Size
src	03-02-2019 21:56	File folder	
target	03-02-2019 21:56	File folder	
Deployment.txt	03-02-2019 22:00	Text Document	1 KB
Jenkinsfile	03-02-2019 21:56	File	1 KB
Jenkinsfile1	03-02-2019 21:56	Text Document	1 KB
pom	03-02-2019 21:56	XML Document	1 KB



SVN examples



jenkins file in brancher folder



Stages based on When condition

```

pipeline{
    agent any
    stages{
        stage('svn'){
            when{
                changelog 'build'
            }
            steps{
                sh ""
            }
        }
    }
}

```

```
echo "found build keyword in the commit, so proceeding further satge "
```

```
""
```

```
}
```

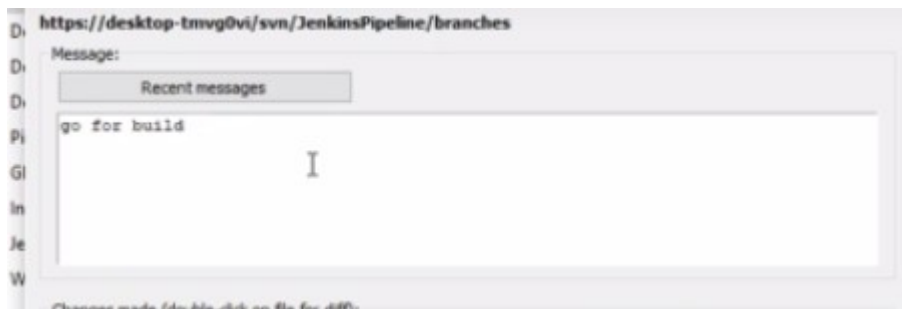
```
}
```

```
}
```

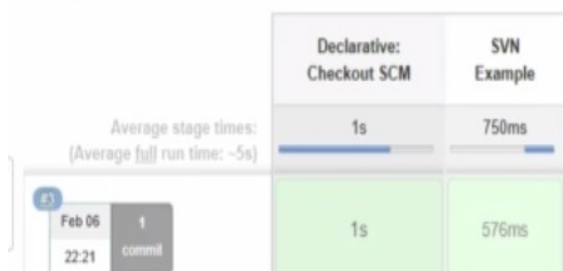
```
}
```

```
}
```

If you commit with build message, then it will build



Stage View



WHEN

When is similar to If condition, but its more advanced with in-built condition

❖ WHEN

- ❖ Run the step when Previous build is Success/Fail
- ❖ Run the step based on the Environment value
- ❖ Changelog
- ❖ Changeset
- ❖ Equals
- ❖ NOT
- ❖ All of
- ❖ Any of
- ❖ File exists
- ❖ When file contains data

Equals and not Equals:

```

pipeline{
    agent any
    environment{
        Tool="Jenkins"
    }
    stages{
        stage('When_equals'){
            when{
                equals expected:'Docker' , actual: "$Tool"
            }

            steps{

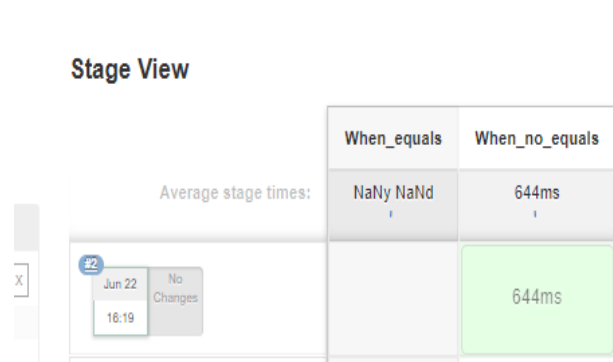
                sh """
                    echo " if when equal "
                """
            }
        }
        stage('When_no_equals'){
            when{
                not {
                    environment name:Tool , value:"Jenkins"
                }
            }

            steps{

                sh """
                    echo " if when not equal "
                """
            }
        }
    }
}

```

O/P equal expected is not matched , not equals is matched



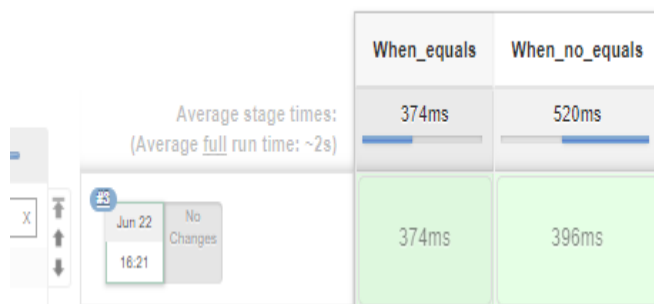
O/P equal expected is matched , not equals is matched.

```

pipeline{
  agent any
  environment{
    Tool="Jenkins"
  }
  stages{
    stage('When_equals'){
      when{
        equals expected:'Jenkins' , actual: "$Tool"
      }
      steps{
        sh """
        echo " if when equal "
        """
      }
    }
    stage('When_no_equals'){
      when{
        not {
          environment name:Tool , value:"Jenkins"
        }
      }
      steps{
        sh """
        echo " if when not equal "
        """
      }
    }
  }
}

```

Stage View



Check previous build result and execute steps

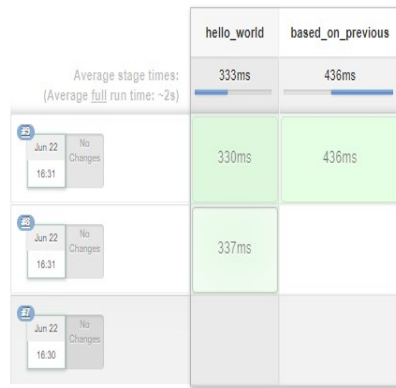
execute when previous build is success

```
pipeline{
    agent any
    environment{
        Tool="Jenkins"
    }
    stages{
        stage('hello_world'){
            steps{

                sh """
                    echo " hello_world "
                """
            }
        }
        stage('based_on_previous'){
            when{
                expression {
                    currentBuild.getPreviousBuild().result == 'SUCCESS'
                }
            }
            steps{

                sh """
                    echo " previous build is failed, now success"
                """
            }
        }
    }
}
```


stage view

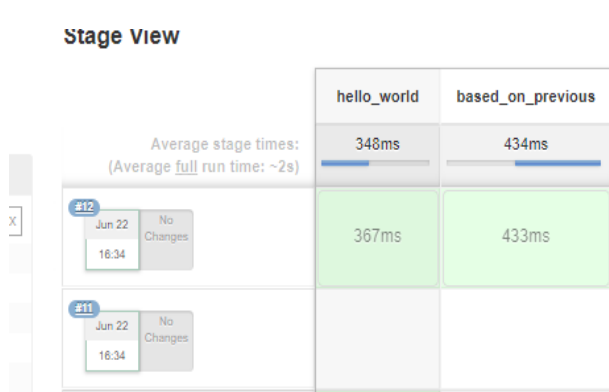


When previous build is failure

```

pipeline{
    agent any
    environment{
        Tool="Jenkins"
    }
    stages{
        stage('hello_world'){
            steps{
                sh """
                    echo " hello_world "
                """
            }
        }
        stage('based_on_previous'){
            when{
                expression {
                    currentBuild.getPreviousBuild().result == 'FAILURE'
                }
            }
            steps{
                sh """
                    echo " previous build is failed, now success"
                """
            }
        }
    }
}

```



Steps based on commit messages (jenkinsfile : SCM)

when they committed with message build, it will get execute

```

pipeline{
    agent any
    stages{
        stage('svn'){
            when{
                changelog 'build'
            }
            steps{
                sh """
                    echo "found build keyword in the commit, so proceeding further stage "
                """
            }
        }
    }
}

```

Steps based on Committed files (jenkinsfile : SCM)

```

pipeline{
    agent any
    stages{
        stage('pythonfile'){
            when{
                changeset '*.py'
            }
            steps{
                sh """
                    echo "commit files contains only for python file "
                """
            }
        }
    }
}

```

```

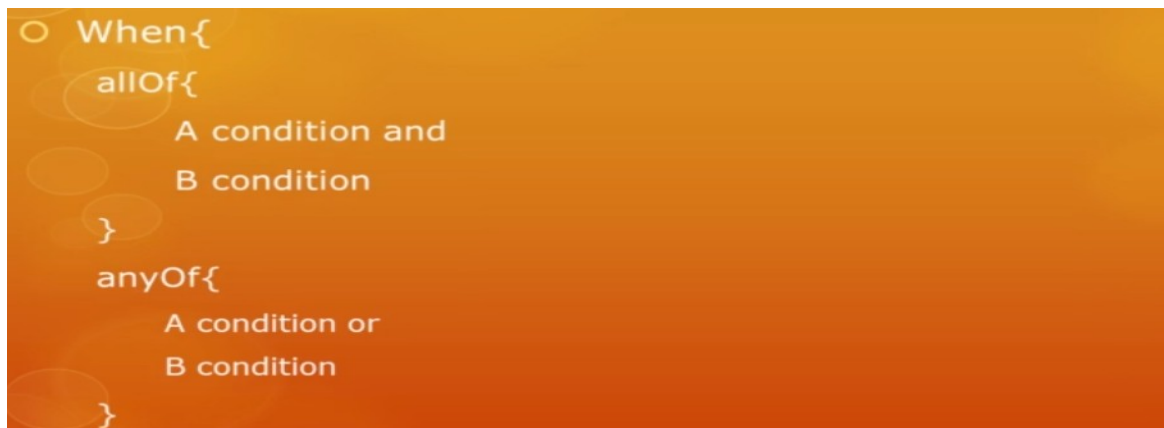
        stage('java_file'){
            when{
                changeset '*.xml'
            }

            steps{

                sh """
                echo " commit files contains only for xml file"
                """
            }
        }
    }
}

```

Allof, Anyof



```

pipeline{
    agent any
    environment{
        Tool="jenkins"
        envv="PRD"
    }
    stages{
        stage('allof'){
            when{
                allof{
                    equals expected: "jenkins" , actual: "$Tool"
                    equals expected: "PRD" , actual: "$envv"
                }
            }

            steps{

                sh """
                echo " when both condition is pass "
                """
            }
        }
    }
}

```

```

stage('anyof'){
when{
anyOf{
equals expected: "jenkins" , actual: "$Tool"
equals expected: "STG" , actual: "$env"
}
}
steps{

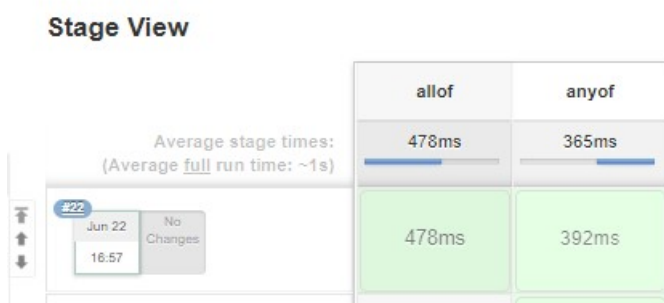
sh """

echo " when any one condition is pass"

"""

}
}
}

```



Execute stage if required string is matched in the file

```

pipeline{
agent any

stages{
stage('string_in_file'){
when{
expression{ return readFile('C:\\Users\\user\\Desktop\\cloudguru_sysops\\files.txt').contains('truncated')}
}

steps{

sh """

echo " string in file "

"""

}
}
}
}

```

Skip Stage always

if you want to skip the stage or skip for few days.

```

pipeline{
    agent any

    stages{
        stage('string_in_file'){
            when{
                return false

                expression{ return readFile("C:\\Users\\user\\Desktop\\cloudguru_sysops\\files.txt").contains('truncated')}
            }

            steps{

                sh """
                    echo " string in file "
                """

            }
        }
    }
}

```

SHELL

Shell Syntax and Commands

```

pipeline{
    agent any
    stages{
        stage('shell'){

            steps{

                sh """
                    ls -l
                    pwd
                """

            }
        }
    }
}

```

Stage Logs (shell) ✕


[Shell Script -- ls -l pwd](#) (self time 274ms)

```

+ ls -l
total 0
+ pwd
/var/jenkins_home/workspace/when

```

Create file with Build Number and Build Name

```

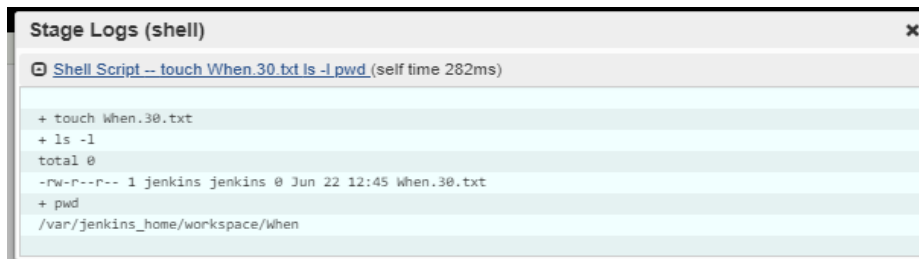
pipeline{

```

```

agent any
stages{
    stage('shell'){
        steps{
            sh """
                touch ${JOB_NAME}.${BUILD_NUMBER}.txt
                ls -l
                pwd
            """
        }
    }
}

```



Sample Local Deployment

Create Html and Copy to the location.

```

pipeline{
    agent any

    stages{
        stage('html'){
            steps{
                bat """
                    echo hello this is my HTML >> "D:\\"
                """
            }
        }
        stage('copy_location'){
            steps{
                bat """
                    copy *.html D:\\tomcat\\
                """
            }
        }
    }
}

```