Extending your Pipeline with Shared Libraries, Global Functions and External Code

Brent Laster

Jenkins World

A global DevOps event

2017

About me

- Senior Manager, R&D at SAS in Cary, NC
- Global Trainer and Speaker
- Git, Gerrit, Gradle, Jenkins, Pipelines
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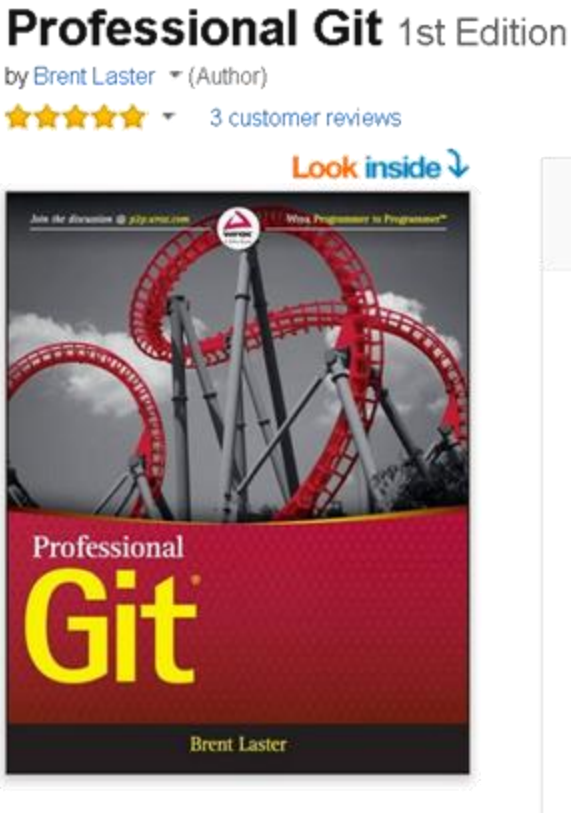
Books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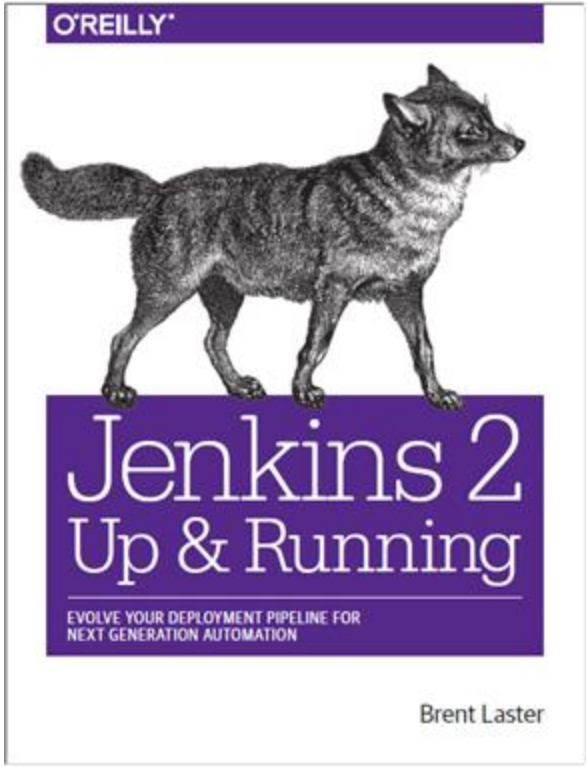
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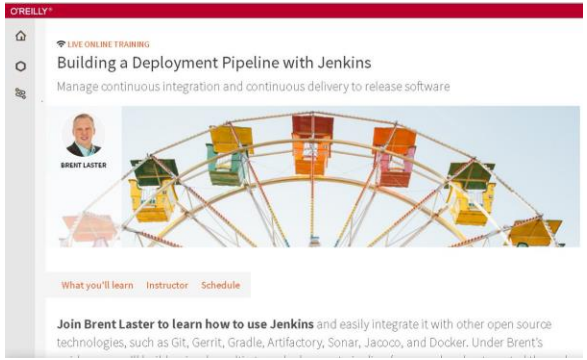
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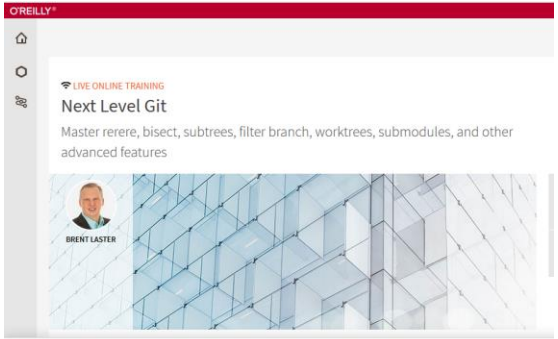
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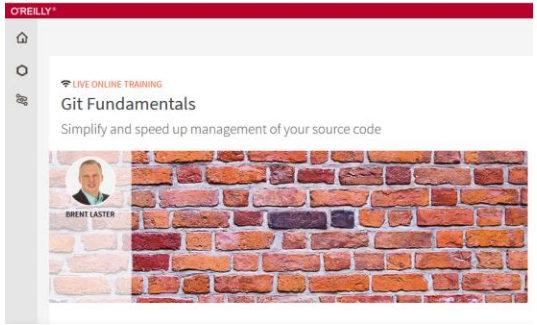
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Starting Point - Jenkins Pipelines


```
node('worker_node1') { // scripted pipeline
    stage('Source') { // Get code
        // Get code from the source repository
        git url: 'http://github.com/brentlaster/greetings.git',
            branch: 'demo'
    }
    stage('Compile') { // Compile and do unit testing
        // Run Gradle
        sh 'gradle clean compileJava test'
    }
}
```

```
pipeline {  // declarative pipeline
    agent {label 'worker_node1'}
    stages {
        stage('Source') { // Get code
            steps { // Get code from the source repository
                git branch:'demo',
                  url:'http://github.com/brentlaster/greetings.git'
            }
        }
        stage('Compile') { // Compile and do unit testing
            steps {  // Run Gradle
                sh 'gradle clean compileJava test'
            }
        }
    }
}
```

What is a Shared Library?

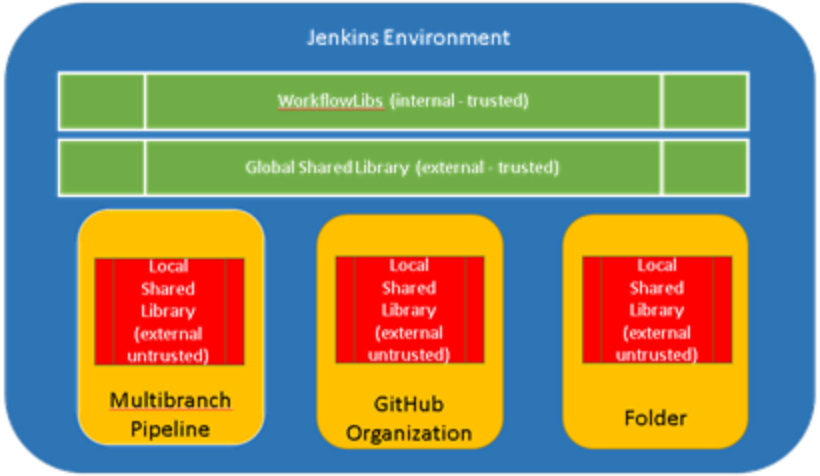
- Functions defined within a specific structure understood by Jenkins
- Stored in a source control system
- Automatically downloaded by Jenkins and made available to your pipeline on import
- Hosted models: Internal and external
- Access levels: Trusted vs. untrusted
- Scopes: global, folder, multi-branch, GitHub organization

Why use Shared Libraries?

- Centralizing functions
- Sharing common code
- Code reuse
- Abstracting out / masking complexity
- Writing code in different syntax, language

Shared Libraries in Jenkins

- Jenkins 2 has many different types of items that can be created.
- For a subset of those types, shared libraries can be defined that only apply to particular items.
- Folders, Multibranch Pipelines, and Github Organization items can each have their own "local" shared pipeline libraries.
- Allows for more dedicated, type-oriented functions to be available to those types and only to those types.
- These types of libraries are considered “untrusted” and run in the “Groovy Sandbox.”

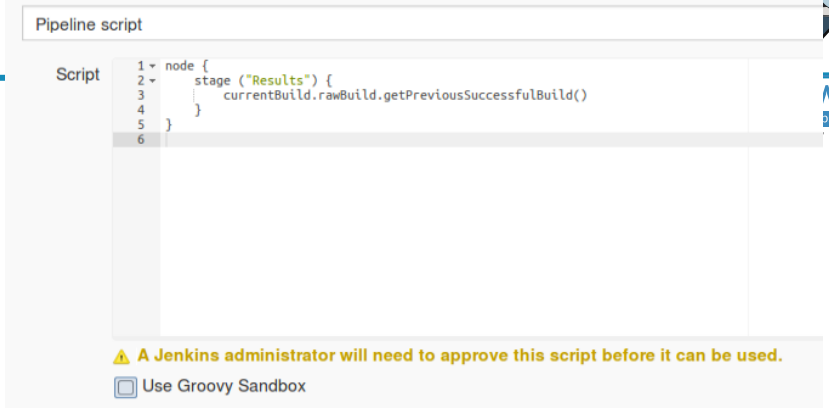


Access Levels: Trusted vs. Untrusted Libraries

- Shared libraries in Jenkins can be in one of two forms: trusted or untrusted.
- Trusted Libraries are ones that can call/use any methods in Java, the Jenkins API, Jenkins plugins, the Groovy language, etc.
  - With great power comes great responsibility - control access!
- Untrusted code is code that is restricted in what it can invoke and use.
  - Not allowed access to call same methods or use internal objects
  - Runs in the Groovy Sandbox
    - » Monitored for calling/using any methods outside of Sandbox's "safe list". If attempted, halted and must have method approved.

Script Approval in General

- Certain scripts/methods require approval
- Global list of approved actions/operations maintained by Jenkins
- Scripts created by administrators are automatically approved (and added to approved list)
- When non-admin saves a script, check is done to see if actions/operations are approved
- If not, request for approval for unapproved pieces is added to a queue in Jenkins

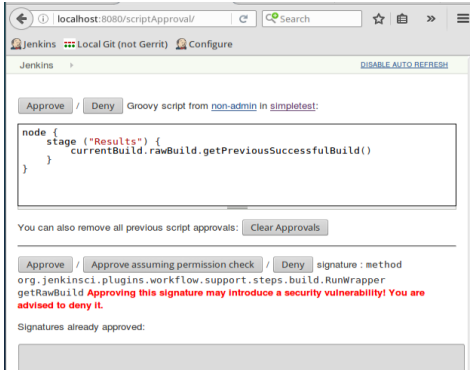


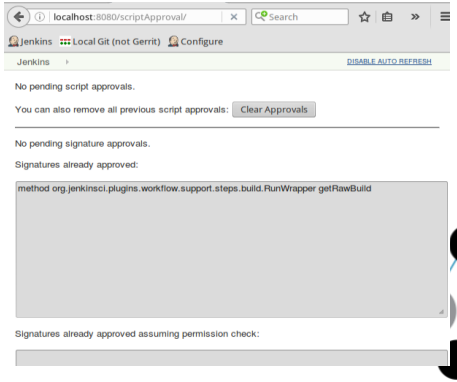
Managed files
e.g. settings.xml for maven, central managed scripts, custom files, ...

In-process Script Approval
Allows a Jenkins administrator to review proposed scripts (written e.g. in Groovy) which run inside the Jenkins process and so could bypass security restrictions. **1 scripts pending approval. 1 signatures pending approval.**

Prepare for Shutdown
Stops executing new builds, so that the system can be eventually shut down safely.

- Jenkins admin can then go to Manage Jenkins->In-process Script Approval and, if they are ok, click Approve
- Trying to run an unapproved script will fail, typically with a message indicating that it needs approval





Groovy Sandboxing

- Approval of every non-administrator script can be challenging and unworkable for teams
- Another option is Groovy Sandboxing
- Whitelist of approved methods (not considered security risks or dangerous) is maintained
- When running in Groovy Sandbox, if script only uses whitelisted, approved methods, can run regardless of user
- If unapproved method is found when run, added to queue for approval by administrator
- Done via Manage Jenkins->In-process Script Approval
- For example, if called to getJobs
- "Approve assuming permissions check" permits running as actual user, not as system call; limits operation to user permissions (for example finding job info)

Pipeline script

Script

```
node {
    stage ("Results") {
        currentBuild.rawBuild.getPreviousSuccessfulBuild()
    }
}
```

☑ Use Groovy Sandbox

```
[Pipeline] node
Running on master in /var/lib/jenkins/jobs/simpletest/workspace
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Results)
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
org.jenkinsci.plugins.scriptsecurity.sandbox.RejectedAccessException: Scripts not permitted to
use method org.jenkinsci.plugins.workflow.support.steps.build.RunWrapper getRawBuild
        at
org.jenkinsci.plugins.scriptsecurity.sandbox.whitelists.StaticWhitelist.rejectMethod(StaticWhiteli
st.java:176)
        at
org.jenkinsci.plugins.scriptsecurity.sandbox.groovy.SandboxInterceptor$6.reject(SandboxInterceptor
.java:243)
        at
org.jenkinsci.plugins.scriptsecurity.sandbox.groovy.SandboxInterceptor.onGetProperty(SandboxInterc
eptor.java:363)
        at org.kohsuke.groovy.sandbox.impl.Checker$4.call(Checker.java:241)
```

In-process Script Approval

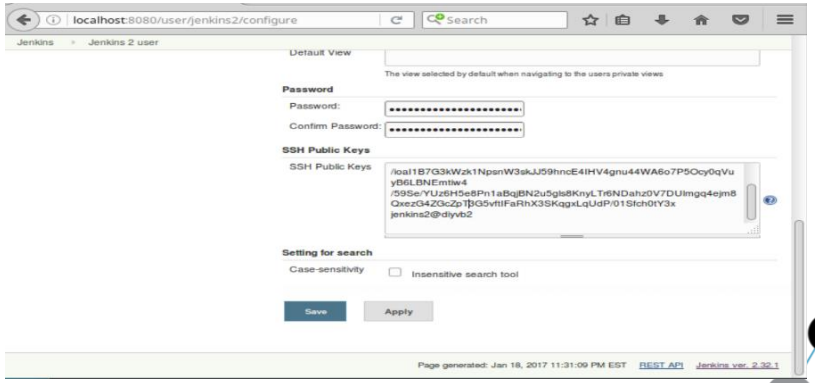
Allows a Jenkins administrator to review proposed scripts (written e.g. in Groovy) which run inside the Jenkins process and so could bypass security restrictions. **1 signatures pending approval.**

Hosted models: Internal vs. External

- Has to do with where the SCM containing the library code is hosted
- Internal - Jenkins includes an internal Git repository that can be leveraged to store internal libraries or for testing purposes.
  - Any content put in this library is trusted for all scripts.
  - But anyone pushing to it has to have the Overall/Runscripts permissions.
- Internal Git repository has a specific name - **workflowLibs.git**.
  - It can be used with Git either through ssh access or through http access.

Accessing Internal Repo via SSH

- Requirements
  - Specify the SSHD port in Jenkins via the Manage Jenkins, Configure Global Security. Use a high number here to avoid needing to use a privileged port.
  - In http://<jenkins url>/user/<userid>/configure, add the user's public ssh key in the SSH Public Keys field on that page.



- Usage

```
git clone ssh://<userid>@<system-name>:<port>/workflowLibs.git
```

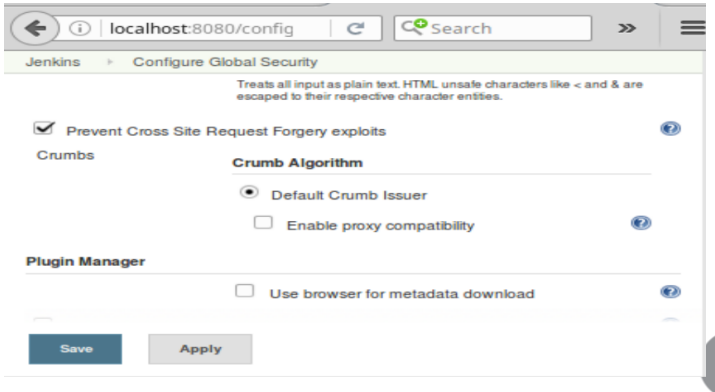
Accessing Internal Repo via http

- Assuming your local Jenkins system is running on localhost on port 8080, you can clone the repository with the command below.

git clone http://localhost:8080/workflowLibs.git

- Potential Issue

Error: RPC failed; HTTP 403 curl 22 The requested URL returned error: 403 No valid crumb was included in the request
fatal: The remote end hung up unexpectedly</p>



  - Solutions
    - » If logged out, log back in
    - » May need to disable the "prevent cross-site forgery attacks" in the Jenkins security settings (temporarily at least).

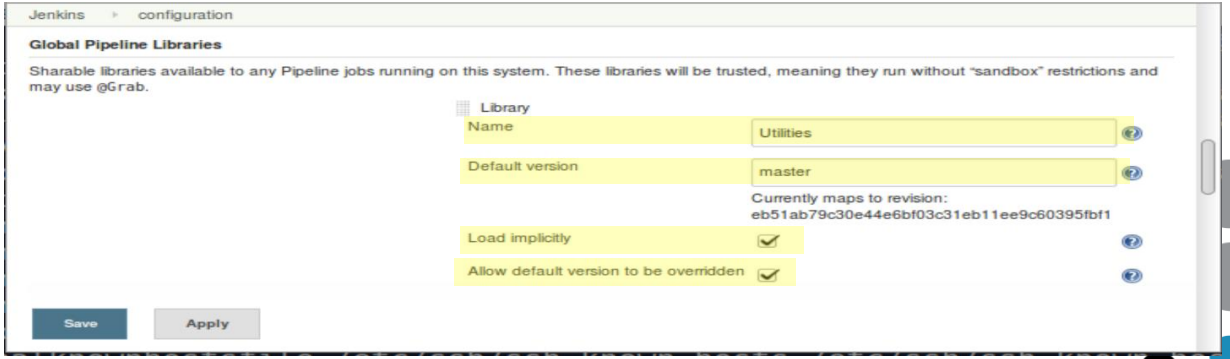
Initializing Internal Repo

- After cloning, library will be empty initially
- To start using it, initialize branch

```
cd workflowLibs
git checkout -b master
```

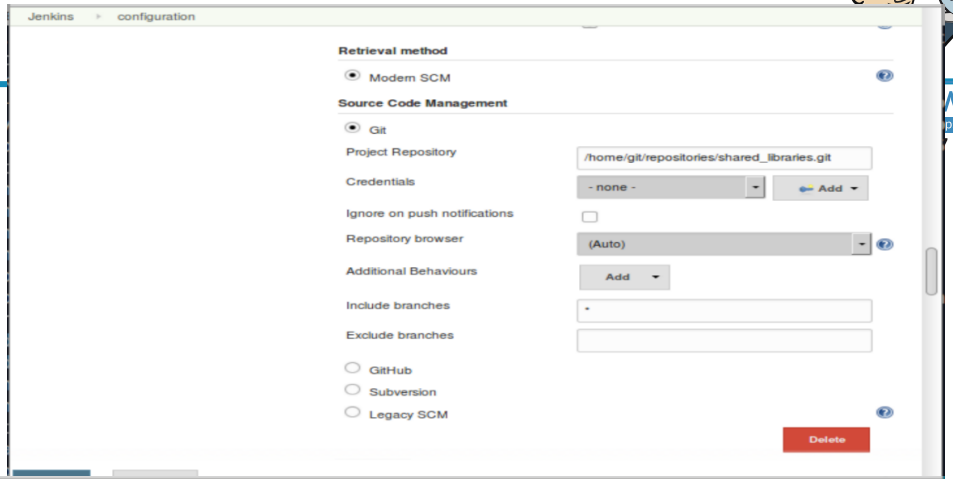
External Libraries

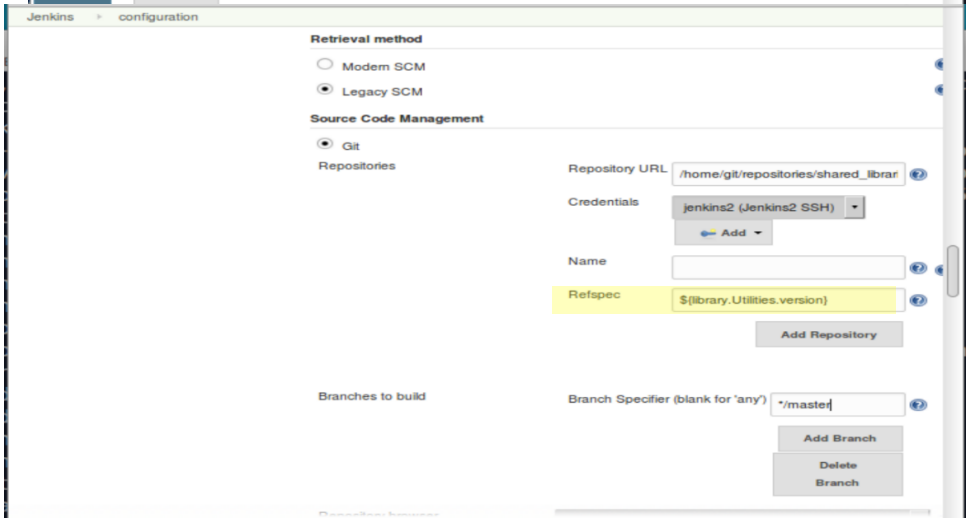
- To define an external library (one stored in a source repository separate from Jenkins) you need to provide a couple of pieces of information:
  - A name for the library (this will be used in your scripts to access it)
  - A version (default version is required if Load Implicitly is used)
  - Option for loading implicitly
  - Option for allowing default version to be overridden
  - A way to find / retrieve it from source control



External Libraries - Telling Jenkins how to load it from source control

- Two options
  - Modern SCM
    - » SCM plugin that has been updated with a new API - to handle pulling a named version
    - » Currently valid for Git, SVN, mercurial, TFS, Perforce
  - Legacy SCM
    - » Use if SCM plugin hasn't been updated
    - » Recommended to include string ${library.<your library name>.version) in specification
    - » String should get expanded to pick up particular version of content
    - » Can use any branch or tag
    - » Best to use fully qualified reference: /refs/tags/<tag.





How Jenkins makes libraries available

- Downloads at start of running job
- Example shows internal library download and external library download

Console Output

```
Started by user Jenkins 2 user
Loading library Utilities@master
 > git rev-parse --is-inside-work-tree # timeout=10
Setting origin to /home/git/repositories/shared_libraries.git
 > git config remote.origin.url /home/git/repositories/shared_libraries.git # timeout=10
Fetching origin...
Fetching upstream changes from origin
 > git --version # timeout=10
 > git fetch --tags --progress origin +refs/heads/*:refs/remotes/origin/*
 > git rev-parse master^{commit} # timeout=10
 > git rev-parse origin/master^{commit} # timeout=10
 > git rev-parse --is-inside-work-tree # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url /home/git/repositories/shared_libraries.git # timeout=10
Fetching upstream changes from /home/git/repositories/shared_libraries.git
 > git --version # timeout=10
 > git fetch --tags --progress /home/git/repositories/shared_libraries.git +refs/heads/*:refs/remotes/origin/*
Checking out Revision a0818784940689a1395c46bbc96dc22c4ba5d756 (master)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f a0818784940689a1395c46bbc96dc22c4ba5d756
 > git rev-list a0818784940689a1395c46bbc96dc22c4ba5d756 # timeout=10
Loading library workflowLibs@master
 > git rev-parse --is-inside-work-tree # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url http://localhost:8080/workflowLibs.git # timeout=10
Fetching upstream changes from http://localhost:8080/workflowLibs.git
 > git --version # timeout=10
 > git fetch --tags --progress http://localhost:8080/workflowLibs.git +refs/heads/*:refs/remotes/origin/*
 > git rev-parse refs/remotes/origin/master^{commit} # timeout=10
 > git rev-parse refs/remotes/origin/origin/master^{commit} # timeout=10
Checking out Revision ddba30eb3e70a8455b4548880aafa1900b1d2ec0 (refs/remotes/origin/master)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f ddba30eb3e70a8455b4548880aafa1900b1d2ec0
 > git rev-list a2e7ce9f3c67688360ebb502a0574bbb7ffaa8ba # timeout=10
[Pipeline] node
```

Loading libraries into your script

- Internal library
  - If content, **workflowLibs** global internal library loaded automatically.
- External libraries
  - Implicit loading ("load implicitly" flag set)
    - » All loaded each time automatically
    - » No annotation needed
  - Explicit loading (scripted syntax)
    - » Requires annotation
      - » Loading default version : @Library('libname')…
      - » Loading explicit version: @Library('libname@version')…
      - » @Library annotation prepares the "classpath" of the script prior to compilation
    - » Imports (optional)
      - » Specify additional import statement for methods, classes, variables : import <items>
      - » If you have annotation and don't have import, specify a "_" after @Library('libname') so annotation has something to link to: @Library('libname')_
    - » Declarative syntax has its own "libraries" section (import used to be supported but no longer)
    - » New 'library' step as of 2.7 (from Shared Groovy Libraries plugin)
      - » Simple syntax for loading library on the fly
        - – Picks up everything from vars area
        - – More explicit syntax if trying to call method in src area since script is already compiled
        - – Allows use of parameters, variables (any interpolated value) for version

Loading Libraries Examples


```
// Load the default version of a library, all content
@Library('myLib')_

// Override the default version and load a specific version of a
library
@Library('yourLib@2.0')_

// Accessing multiple libraries with one statement
@Library(['myLib', 'yourLib@master'])_

// importing specific methods
import static org.demo.Utilities.*

// Annotation with import
@Library('myLib@1.0')
import static org.demo.Utilities
```

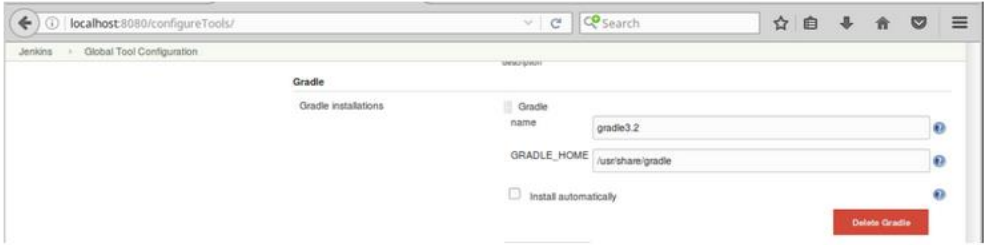
```
// Declarative syntax

pipeline {
    agent any
    libraries {
      lib("mylib@master")
      lib("alib")
    }
    stages {
      ...

// New library step – as of 2.7
//  From Shared Groovy Libraries Plugin
//  access anything from vars/ area
library ‘my-shared-lib’
library ‘my-shared-lib@version’
library ‘my-shared-lib@$LIB_VERSION

// using static class methods from src/ area
library(‘my-shared-lib’).org.demo.pipe.Utils2.aStaticMethod()
```

Sample Library Routine

- Simple routine to invoke gradle build with timestamps

```
timestamps {
    <path-to-gradle-home>/bin/gradle <tasks>
}
```

- **timestamps** is a Jenkins Pipeline DSL step .
- **timestamps** closure here simply tells Jenkins to add timestamps to the console output for this part of our pipeline (the gradle build step)
- Can use gradle version as pointed to by tool configuration in Jenkins



- Actual code

```
timestamps {
    sh "${tool 'gradle3.2'}/bin/gradle ${tasks}"
}
```

Shared Library Structure

- Repository Structure

```
.
├── resources
├── src
│   └── org
│       └── foo
│           └── Utilities.groovy
└── vars
    └── mailUser.groovy
```

  - src directory is added to classpath when pipeline is executed
  - vars directory is for global variables or scripts accessible from pipeline scripts; can have corresponding txt file with documentation
  - resources directory can have non-groovy resources that get loaded from a “libraryResource” step in external libraries

src

- Intended to be setup with groovy files in the standard Java directory structure (i.e. src/org/foo/bar.groovy).
- Added to the classpath when pipelines are executed.
- Any Groovy code valid to use here.
- Generally invoke some kind of pipeline processing using the available pipeline steps.
- Several options for how to implement the step calls within the library and how to invoke them from the script.

src example 1

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- You can create a simple method, not enclosed by a class
- Can invoke pipeline steps

*buildUtils.groovy

```
// org/demo/buildUtils.groovy
package org.demo
def timedGradleBuild(tasks) {
    timestamps {
        sh "${tool 'gradle3.2'}/bin/gradle ${tasks}"
    }
}
```

- Stored in library, loaded implicitly
- This can be invoked in a pipeline via

```
@Library('Utilities')_
node('worker_node1') { // scripted pipeline
    stage('Source') { // Get code
        // Get code from the source repository
        git url: 'http://github.com/brentlaster/greetings.git',
            branch: 'demo'
    }
    stage('Compile') { // Compile and do unit testing
        // Run Gradle
        def myUtils = new org.demo.buildUtils()
        myUtils.timedGradleBuild 'clean build'
    }
}
```

src example 2

- Create an enclosing class (facilitates things like defining a superclass)
- Get access to all of the DSL steps by passing the steps object to a method
  - Passed in a constructor or in a method of the class
  - Since enclosed in a class, the class must implement Serializable to support saving the state if the pipeline is stopped or restarted.
  - Also works for environment variables
- Invoked as shown below

BuildUtils2.groovy

```
// org/demo/BuildUtils2
package org.demo
class BuildUtils2 implements Serializable {
    def env
    def steps
    BuildUtils2(env, steps) {
        this.env = env
        this.steps = steps
    }
    def timedGradleBuild(tasks) {
      def gradleHome = steps.tool 'gradle3.2'
      steps.sh "echo Building for ${env.BUILD_TAG}"
      steps.timestamps {
          steps.sh "${steps.tool 'gradle3.2'}/bin/gradle ${tasks}"
      }
    }
}
```

```
@Library('Utilities')
import org.demo.BuildUtils2

def bldtools = new BuildUtils2(env, steps)
node ('worker_node1') {
    stage('Source') { // Get code
        // Get code from the source repository
        git url: 'http://github.com/brentlaster/greetings.git',
            branch: 'demo'
    }
    stage('Compile') { // Compile and do unit testing
        // Run Gradle
        bldtools.timedGradleBuild("clean build")
    }
}
```

src example 3

- Can also use static method and pass in script object - already has access to everything

BuildUtils3.groovy

```
// org.demo.BuildUtils3
package org.demo
class BuildUtils3 {
   static def timedGradleBuild(script, tasks) {
     def gradleHome = script.tool 'gradle3.2'
     script.sh "echo Building for ${script.env.BUILD_TAG}"
     script.timestamps {
        script.sh "${script.tool 'gradle3.2'}/bin/gradle ${tasks}"
     }
   }
}
```

- Can be invoked similarly - note “import static”

```
@Library('Utilities') import static org.demo.BuildUtils3.*
node ('worker_node1') {
    stage('Source') { // Get code
        // Get code from the source repository
        git url: 'http://github.com/brentlaster/greetings.git',
            branch: 'demo'
    }
    stage('Compile') { // Compile and do unit testing
        // Run Gradle
        timedGradleBuild this, 'clean build'
    }
}
```

vars

- Area for hosting scripts that define variables that you want to access in the pipeline
- Scripts are instantiated as singletons when accessed
- Basename should be a valid Groovy identifier
- Can have a <basename>.txt file that contains help or other documentation for the variable. This file can use HTML or Markdown.

vars example 1 - set of methods

- Can define set of methods in a file
- "cmd" and "cmdOut" here are not fields. These are objects created on demand
- Use it in script

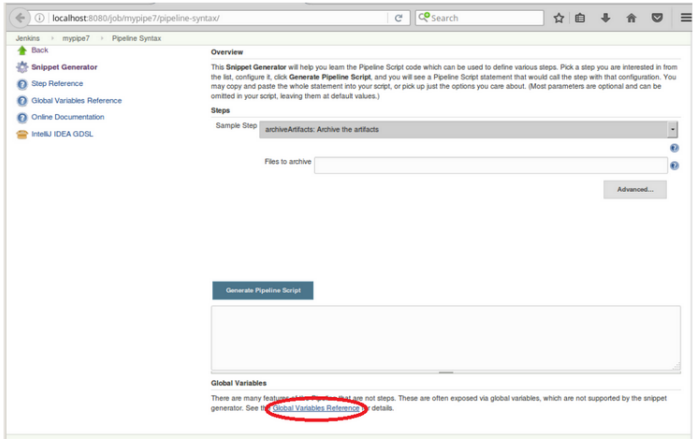
```
// vars/timedCommand.groovy
def setCommand(commandToRun) {
    cmd = commandToRun
}

def getCommand() {
    cmd
}

def runCommand() {
   timestamps {
      cmdOut = sh (script:"${cmd}", returnStdout:true).trim()
   }
}

def getOutput() {
   cmdOut
}
```

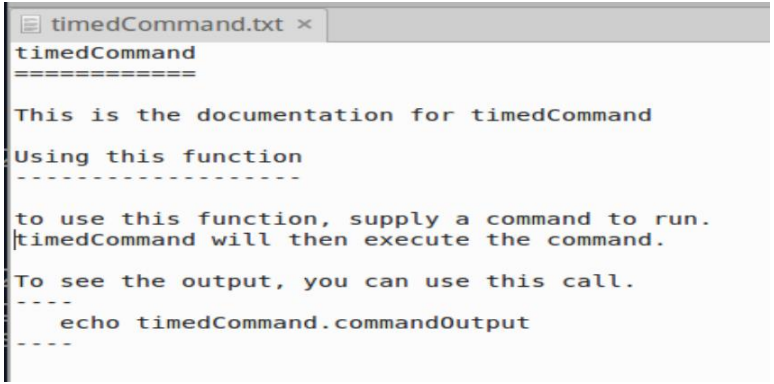
```
node {
      timedCommand.cmd = 'ls -la'
      echo timedCommand.cmd
      timedCommand.runCommand()
      echo timedCommand.getOutput()
}
```

```
[Pipeline] node
Running on worker_node2 in /home/jenkins2/worker_node
/jw17-vars-example-1
[Pipeline] {
[Pipeline] echo
ls -la
[Pipeline] timestamps
[Pipeline] {
[Pipeline] sh
17:20:44 [jw17-vars-example-1] Running shell script
17:20:44 + ls -la
[Pipeline] }
[Pipeline] // timestamps
[Pipeline] echo
total 8
drwxrwxr-x 2 jenkins2 jenkins2 4096 Aug 24 17:20 .
drwxrwxr-x 7 jenkins2 jenkins2 4096 Aug 24 17:20 ..
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

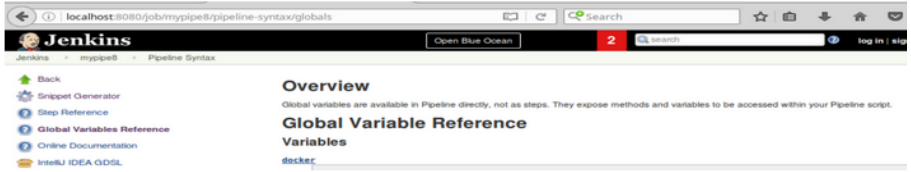
vars - automatic documentation

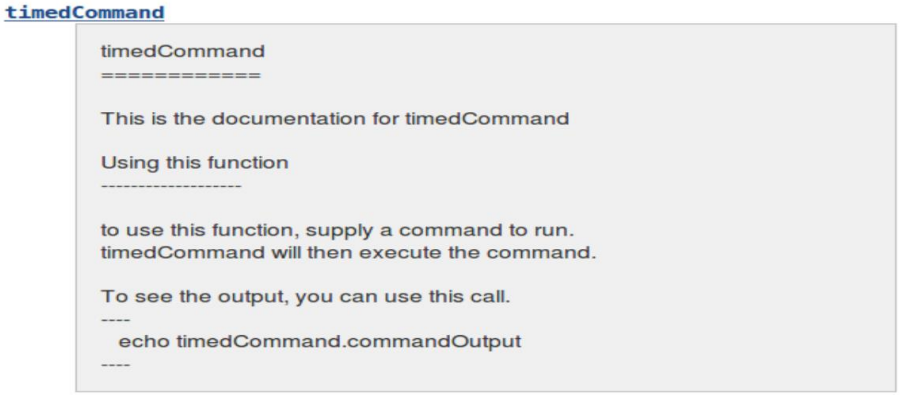
- Create corresponding .txt file >





After run, access Global Variables reference





- Documentation is present >

vars example 2 - Creating global variables that act like steps

- use “call” structure to create function like DSL step

```
// vars/timedCommand2

def call (String cmd, String logFilePath) {
   timestamps {
      cmdOutput = sh (script:"${cmd}", returnStdout:true).trim()
   }
   echo cmdOutput
   writeFile file: "${logFilePath}", text: "${cmdOutput}"
}
```

```
[Pipeline] node
Running on worker_node3 in /home/jenkins2/worker_node
[Pipeline] {
[Pipeline] timestamps
[Pipeline] {
[Pipeline] sh
18:07:37 [jw17-vars-example-2] Running shell script
18:07:38 + ls -la
[Pipeline] }
[Pipeline] // timestamps
[Pipeline] echo
total 8
drwxrwxr-x 2 jenkins2 jenkins2 4096 Aug 24 18:07 .
drwxrwxr-x 6 jenkins2 jenkins2 4096 Aug 24 18:07 ..
[Pipeline] writeFile
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

- use in pipeline script

```
timedCommand2 'ls -la', 'listing.log'
```

vars example 3 - Passing a closure

- Can define method to take closure and do some operation; useful to do things like run on a node >
- Invoke from script as below

```
@Library('Utilities')_
node {
  timedCommandLinux {
      echo "Start"
      sleep 5
      echo "End"
  }
}
```

```
// vars/timedCommandLinux.groovy

def call(Closure commands) {
   node('linux') {
       timestamps {
           commands()
       }
   }
}
```

```
[Pipeline] node
Running on worker_node1 in /h
[Pipeline] {
[Pipeline] node
Running on linux in /home/jen
[Pipeline] {
[Pipeline] timestamps
[Pipeline] {
[Pipeline] echo
18:31:26 Start
[Pipeline] sleep
18:31:26 Sleeping for 5 sec
[Pipeline] echo
18:31:31 End
[Pipeline] }
[Pipeline] // timestamps
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

vars example 4 - DSL call with named parameters

- uses map (settings = [:])
- delegate allows using the values passed in in our mapping
- use only valid pipeline steps!
- call with simple syntax (named parameters)

```
// vars/timedCommand4.groovy

def call(body) {
    // collect assignments passed in into our mapping
    def settings = [:]
    body.resolveStrategy = Closure.DELEGATE_FIRST
    body.delegate = settings
    body()

    // now, time the commands
   timestamps {
      cmdOutput = sh (script:"${settings.cmd}", returnStdout:true).trim()
   }
   echo cmdOutput
   writeFile file: "${settings.logFilePath}", text: "${cmdOutput}"
}
```

```
@Library('Utilities')_
node {
  timedCommand4 {
      cmd = 'ls -la'
      logFilePath = 'log.out'
  }
}
```

resources

- Files in this directory can be non-groovy
- Can be loaded via the libraryResource step in an external library; loaded as a string
- Intended to allow external libraries to load up additional non-groovy files they may need
- Examples: datafile (xml, json, etc.)
- Syntax: `def datafile = libraryResource 'org/conf/data/lib/datafile.ext'`
- libraryResource can also be used to load up any resource needed in a script (requires caution!)

```
def myExternalScript = libraryResource 'externalCommands.sh'
sh myLatestScript
```

- can be useful to separate out non-pipeline code or programmatically specify different files to load based on conditions

Using 3rd-party libraries

- Shared libraries can also make use of third-party libraries using the @Grab annotation
- @Grab annotation provided through the Grape dependency manager that is built in to Groovy
- Allows you to pull in any dependency from a Maven repository, such as Maven Central
- Can be done from trusted libraries – doesn't work in Groovy Sandbox
- Invocation

```
node {
        timedCommand5("sleep 10")
}
```

- Output

```
[Pipeline] node
Running on worker in /home/jenkins2/worker_node1/workspace/mypipe11
[Pipeline] {
[Pipeline] echo
The process took 10.009 seconds.

[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

```
// vars/timedCommand5.groovy

@Grab('org.apache.commons:commons-lang3:3.4+')
import org.apache.commons.lang.time.StopWatch

def call(String cmdToRun) {
      def sw = new StopWatch()
      def proc = "$cmdToRun".execute()
      sw.start()
      proc.waitFor()
      sw.stop()
      println( "The process took ${(sw.getTime
()/1000).toString()} seconds.\n")
}
```

Loading Code Directly

- Similar to shared libraries, but not loaded from source control

```
def call(String cmd, String logFilePath) {
   timestamps {
      cmdOutput = sh (script:"${cmd}", returnStdout:true).trim()
   }
   echo cmdOutput
   writeFile file: "${logFilePath}", text: "${cmdOutput}"
}
return this;
```

- Note “return this” – necessary to make sure correct scope is returned for load
- Example use: Load and invoke

```
node {
   def myProc = load '/home/diyuser2/timedCommand2.groovy'
   myProc 'ls -la', 'command.log'
}
```

Declarative Pipelines and Library Directive

- Declarative syntax has “libraries” directive
- lib statement defines libraries and versions to load similar to @Library annotation
- Functions must be callable in declarative syntax
- Usually works better to use global variables to avoid having to try to use something from classpath
- Per Cloudbees: “Unless you need to create one class with a bunch of static methods it is easier to use global vars in the /vars directory instead of classes in the /src directory.”

```
pipeline {  // declarative pipeline
    agent {label 'worker_node1'}
    libraries {
       lib('Utilities')
    }
    stages {
        stage('Source') { // Get code
            steps { // Get code from the source repository
                git branch:'demo',
                  url:'http://github.com/brentlaster/greetings.git'
            }
        }
        stage('Compile') { // Compile and do unit testing
           steps {  // Run Gradle
             timedCommand2 'gradle clean compileJava test','build.log'
           }
        }
    }
}
```

Library step

- New as of 2.7 with Pipeline Shared Groovy Libraries plugin
- No annotation or section necessary
- Simple syntax for vars area = library('name')
- For src area (scripted pipeline only) can fully qualify name of static method to call = library('name').<lib path>.<static method>
- Can also use computed value for version = library "name@VARIABLE_VALUE"

```
stage('Compile') { // Compile and do unit testing
        // Run Gradle
        library('Utilities')
        timedCommand2 'gradle clean build', 'build.log'
    }
```

```
stage('Compile') { // Compile and do unit testing
  steps {  // Run Gradle
    library 'Utilities'
    timedCommand2 'gradle clean compileJava test','build.log'
  }
}
```

```
node ('worker_node1') {
    stage('Source') { // Get code
        // Get code from the source repository
        git url: 'http://github.com/brentlaster/greetings.git',
            branch: 'demo'
    }
    stage('Compile') { // Compile and do unit testing
        // Run Gradle
        library('Utilities').org.demo.BuildUtils3.timedGradleBuild \
          this, 'clean build'
    }
}
```

Loading code from external SCM

- Requires Remote Loader Plugin*
- Provides fileLoader DSL

fileLoader

Provides methods for loading Pipeline objects from remote sources. More info about available methods and their parameters: the plugin's Wiki page

Available methods

The variable provides following methods:

- **fromGit(String libPath, String repository, String branch, String credentialsId, String labelExpression)** - loading of a single Groovy file from the specified Git repository
- **withGit(String repository, String branch, String credentialsId, String labelExpression)** - wrapper closure for multiple files loading from a same Git repo
- **fromSVN(String libPath, String repository, String credentialsId, String labelExpression)** - loading of a single Groovy file from the specified SVN repository
- **withSVN(String repository, String credentialsId, String labelExpression)** - wrapper closure for multiple files loading from a same SVN repo
- **load(String libPath)** - loading of an object from a Groovy file specified by the relative path. Also can be used within `withGit()` closure to load multiple objects at once

brentlaster / utilities

Code | Issues 0 | Pull requests 0 | Projects 0 | Wiki

Branch: master — utilities / jenkins / pipeline / timedCommand.groovy

sasbcl fix capitalization

2 contributors

9 lines (8 sloc) | 231 Bytes

```
public timedCommand(String cmd, String logFilePath) {
   timestamps {
      cmdOutput = sh (script:"${cmd}", returnStdout:true).trim()
   }
   echo cmdOutput
   writeFile file: "${logFilePath}", text: "${cmdOutput}"
}
return this;
```

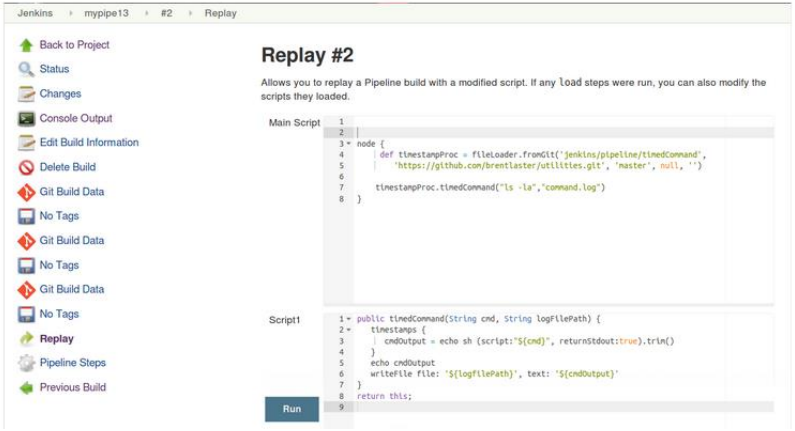
- Invoke as below from script

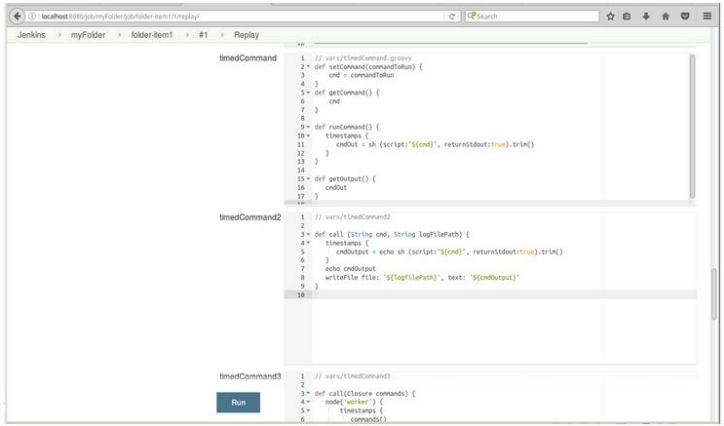
```
def timestampProc = fileLoader.fromGit('jenkins/pipeline/timedCommand'
  |'https://github.com/brentlaster/utilities.git', 'master', null, '')

timestampProc.timedCommand("ls -la","command.log")
```

- Written prior to shared-libraries and not guaranteed to be maintained.

Replay for Libraries

- Only available for untrusted libraries
- Can be invoked after successful run





- If multiple libraries used and untrusted, all are loaded
- Reminder: shared libraries at scope of folder, multibranch, Github organization are untrusted

That’s all - thanks!

@BrentCLaster
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