Achieving Multiple Tool and Technology Build Automation Success

Tom Canova

DELL
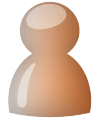The power to do more

http://www.dell.com/us/enterprise

Agenda

- The Multiple Tool Technology Challenge
- The Ultimate Goal
- Tips and Techniques to Get There

The Multiple Tool Technology Challenge

- Single vendor paradise …
- The right tool for the right job
- Legacy/inherited tools/technologies
- Some technologies in our build technology stack
  - ant
  - maven
  - gradle
  - Microsoft TFS
  - subversion
  - HP Fortify
  - OpenSuse Build Services (OBS)
  - various VMWare products
  - linux shell scripts, yum, etc…
  - Jenkins

The ultimate goal

- Increase productivity and quality in the product being developed
  - limit manual tasks to the creative tasks involved in creating the product
  - provide timely and effective communication
  - support quality thru repeatability, automated testing, automated code analysis

Tips and Techniques

- Test First
- Jenkins Plugins
- Taking Jenkins further with Groovy
- Loosely coupled jobs
- Effective Communication
- Reusability and Maintainability Tips

Test First

- Test outside of Jenkins

```
 tfs.gradle
49
50     // initialize svn_paths from SVN_URL_:
51     // initialize currentRevisionMap and c
52     svn_paths = []
53     currentRevisionMap = [:]
54     currentRevisionXML = ""
55
56     if (project.hasProperty('test')) {
57         // initialize properties for test
58         env.put('SVN_URL_1','https://omb-:
59         env.put('SVN_REVISION_1','11946')
60         env.put('SVN_URL_2','https://omb-:
61         env.put('SVN_REVISION_2','10366')
62         env.put('SVN_URL_3','https://omb-:
63         env.put('SVN_REVISION_3','9862')
```

```
C:\test>gradle -b tfs.gradle -Ptest
:getRevisionFilesTestset.    This par
:getPriorRevisionscally this par
:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLog_https://svn1.us.dell.com/svn
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:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLogs
:getSvnLogsTest
:gradleInit

BUILD SUCCESSFUL
```
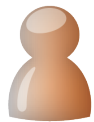
Test First

- Test Environment Options
  - Sandbox Jobs to test Jenkins changes without impacting execution of live jobs

Test First

- Use a Slave to isolate test load so automation changes that are being tested don't have an adverse impact on your live jobs

Slave Linux-10.35.178.155 (Linux Slave Node)

Labels: CI LINUX

Projects tied to Linux-10.35.178.155

S	W	Name ↓	Last Success
🟢	☀	Clean-up job repository caches linux slave	4 days 12 hr (#11)
🟢	⛅	AAA_CI	2 days 23 hr (#154)
🟢	☀	AAAAppliance_RPMRepo	2 days 17 hr (#2)
🟢	☀	M1Appliance_RPMRepo	16 hr (#12)
🟢	☀	Sandbox-CI	3 days 21 hr (#56)
🟢	☀	SandboxAppliance_RPMRepo	3 days 1 hr (#45)
🟢	☁	Trunk_Fortify	16 days (#17)
🟢	☀	TrunkAppliance_RPMRepo	21 hr (#15)
🟢	🌧	testing-regex	8 days 2 hr (#34)
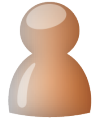
Plugins

- Yes!
- Some plugins we are using to tie our multiple technologies together

Enabled	Name ↓
☑	Maven 2 Project Plugin
☑	Copy Artifact Plugin Adds a build step to copy artifacts from another project.
☑	Email-ext plugin This plugin is a replacement for Jenkins's email publisher
☑	Parameterized Trigger Plugin
☑	Gradle Plugin This plugin allows Jenkins to invoke Gradle build scripts directly.
☑	Jenkins TextFinder plugin This plugin is used to search for strings in workspace files. The out to mark the build as normal or failed.
☑	PeriodicBackup Plugin Backup or restore your Hudson configuration files

Taking Jenkins further with Groovy

- When existing plugins won't do it all
- Leverage a powerful language like groovy or ruby that works well with Jenkins
- Why Groovy
  - Java ecosystem
  - Java expertise
  - Gradle, a Groovy DSL (alternative to Mvn+Ant)
  - Jenkins API
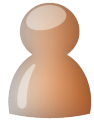
Taking Jenkins further with Groovy

- Traceability & TFS, Subversion, Jenkins
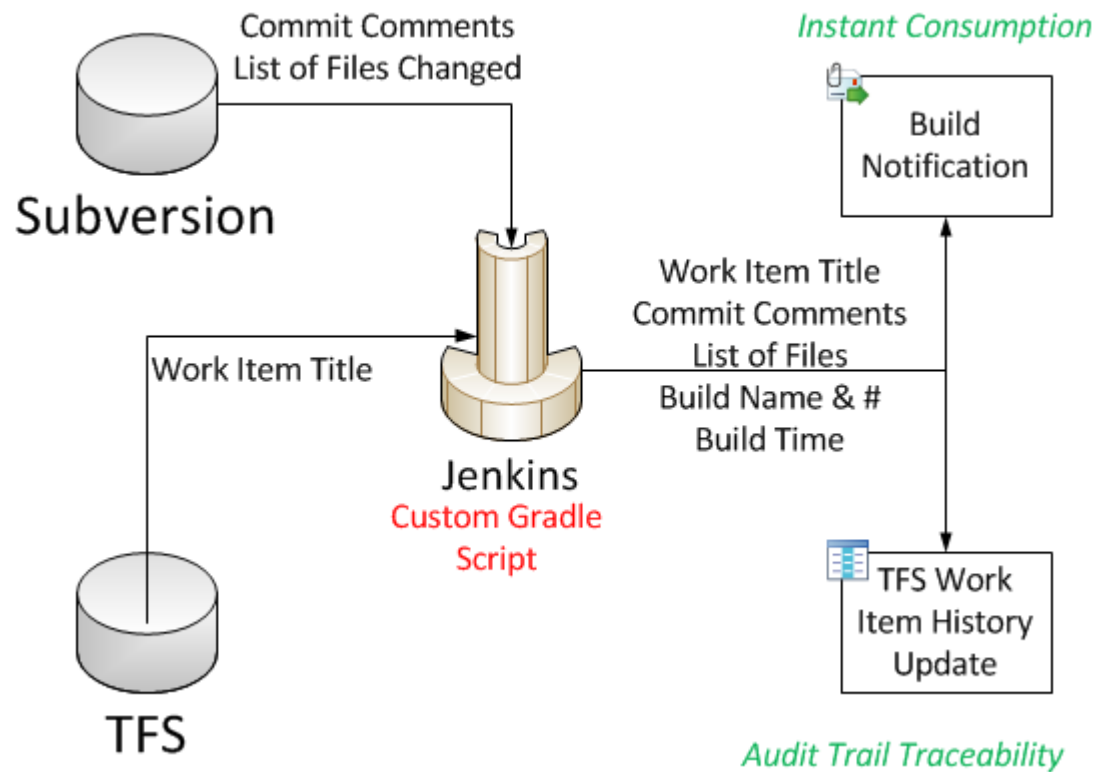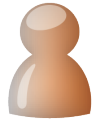
Taking Jenkins further with Groovy
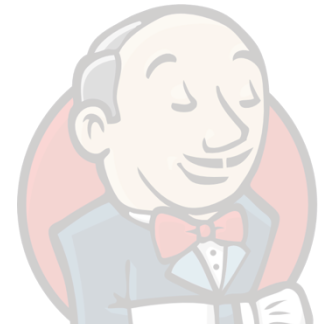
- Subversion Commit Comments

Revision 15002 by James
TFSID: 6440 Remove redundant isEmpty check. Reviewed by: N/A

/trunk/main/java/com/dell/commons/integration/DAO.java (diff)

Revision 15001 by James
Ensure file streams are closed using finally blocks in utility functions. Reviewed by: N/A

/trunk/main/java/com/dell/commons/utilities/Utils.java (diff)

Revision 15000 by j f
Change Summary: clear flag on servers if the template has V enabled set to false. (Fix for Defect 5128
Reviewed By: Mohammad
Tested By: Manually enable V on i, and clear the flag.
TFSID:5128

/trunk/main/java/com/dell/business/device/Service.java (diff)

Taking Jenkins further with Groovy

- TFS History

Defect 5128 : i v does not get disabled even if it is disabled in the template

Planning

Severity: Sev 2 ▼   Priority: 2-Medium ▼   Target Fix Date: ▢ 📅▼

| Description | System Info | Attachments | Fix | Test Cases | Other | All Links | History |

History:

Type your comment here.

⊟ **4/26/2012 6:08:20 PM   Edited by Service**

Work Item Referenced in Build jenkins-:TrunkAppliance-1013
Subversion Revision: 15000 'trunk
Author:j_f   Date:2012-04-26T19:07:06.981323Z
Commit Message: Change Summary: clear flag on servers if the template has VI enabled set to false. (Fix f
Reviewed By: Mohammad
Tested By: Manually enable V on i, and clear the flag.
TFSID:5128
Files Changed:
M https://us.dell.com/svn/'trunk/main/java/com/dell/'business/device/Service.java
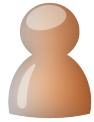
Taking Jenkins further with Groovy

- Email

Subject: SkyhawkTrunkAppliance - Build # 1013 - Successful!

[Build 1013 Home Page](#) · [Appliance Files](#) · [Build Console Log](#) · [OBS Console Log](#) · [OBS Package Logs](#)
[BVT Console Log](#) · [BVT SoapUI Logs](#) · [BVT Appliance Logs](#) · [Unit Test Report](#)
Total Unit Tests:374 .... **Failed Unit Tests**:0

Subversion Changes, Traced to TFS Work Items Where Applicable, Since Last Successful Execution of This Job
TFS ID:5128 *i. v. does not get disabled even if it is disabled in the template*

- **Subversion Revision**: 15000 trunk

  ```
  Author:j_f
  Date:2012-04-26T19:07:06.981323Z
  Commit Message:
  Change Summary: clear flag on servers if the template has V
  enabled set to false. (Fix for Defect 5128
  Reviewed By: Mohammad
  Tested By: Manually enable V on i, and clear the flag.
  TFSID:5128
  Files Changed:
  M trunk/main/java/com/dell/business/device/Service.java
  ```
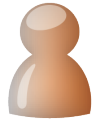
Loosely Coupled Jobs

- Use Plugins – don't hardcode a script to point to a related jobs workspace to get artifacts
- Allow parallelism across nodes
- Divide/refactor large jobs along natural functional/technology boundaries
- Loose Coupling Fosters Reuse

Copy artifacts from another project

Project name: $STEP1_PROJECT

⚠ Value references a build parameter, so it cannot be validated.

Which build: Copy from WORKSPACE of latest completed build

Limitation Note

Artifacts to copy: Appliance${BRANCHPATH}appliance-setup${DEFAULT_RPM_SOURCE_TAG}-${APPLIANCE_VERSION}.tar.bz2,Appliance${BRANCHPATH}pkg/appliance-setup.spec

Target directory: $OBS_PROJECT/appliance-setup

☑ Flatten directories   ☐ Optional

Effective Communiction

- Jenkins is nice, but …
- Timely information delivery
- Consumable information

Build 1013 Home Page · Appliance Files · Build Console Log · OBS Console Log · OBS Package Logs
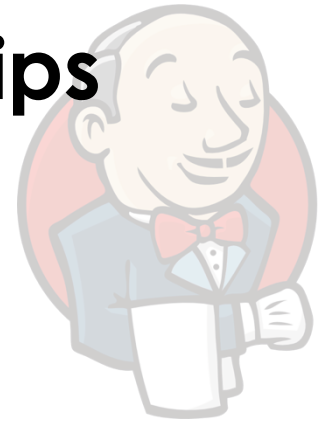BVT Console Log · BVT SoapUI Logs · BVT Appliance Logs · Unit Test Report
Total Unit Tests:374 .... **Failed Unit Tests**:0

```
Files Changed:
M Commons/trunk/main/java/com/dell/commons/utilities/Utils.java
```
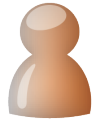
Reusability and Maintainability Tips

- Target Multiple platform types

```
C:\test>gradle -b tfs.gradle -Ptest
:getRevisionFilesTestset.    This par
:getPriorRevisionscally this var
:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLog_https://svn1.us.dell.com/svn
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:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLog_https://svn1.us.dell.com/svn
:getSvnLogs
:getSvnLogsTest
:gradleInit

BUILD SUCCESSFUL
```

```
16:01:35  [:          ] $ /home/jenkins/.jenkins/tools/Gradle_1.0-milestone-7/bin/gradle -DAPPLIANCE_BUILD_NUMBER=${BUILD_NUMBER} -DOB
D:    AWK_REPO=obs://    awk:trunk/centos5 -DHTMLPATHROOT=file://///    ·builds.aus.amer.dell.com/builds$/hudson/         -DVMWARE_T
DSTEP1_PROJECT=    .awkTrunkAppliance -DYUM_REPO_TARGET=/mnt/builds2/yum/.    awk/trunk -DM2_SETTINGS=public-appliance_settings.xml
PFILES_URL_REPLACE_TARGET=svn1.us.dell.com/cgi-bin/viewvc -PFILES_URL_ADD_REVISION_SUFFIX --info printWorkItemChanges -b tfs.gradle
16:01:36  Starting Build
16:01:37  Settings evaluated using empty settings file.
16:01:37  Projects loaded. Root project using build file '/home/jenkins/.jenkins/workspace/awkTrunkAppliance/tfs.gradle'.
```

Reusability and Maintainability Tips
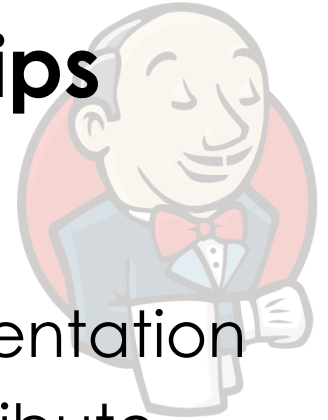
- Help another team to leverage
  - sensitivity to code quality and documentation
  - more people know and support/contribute
  - consider a Jenkins plugin

Subversion Changes, Traced to TFS Work Items Where Applicable, Since Last Successful Execution of This Job
TFS ID:No_Work_Item_ID_In_Commit_Msg *Work Item Title NA*

- **Subversion Revision**: 15001 Commons/trunk

  Author:James
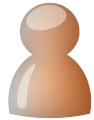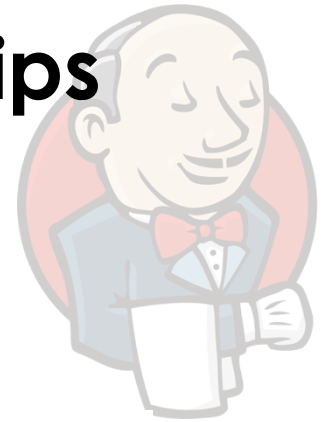 Date:2012-04-26T19:08:53.752879Z
  Commit Message:
  Ensure file streams are closed using finally blocks in   utility functions. Reviewed by: N/A

  Files Changed:
  M Commons/trunk/main/java/com/dell/commons/utilities/Utils.java

Reusability and Maintainability Tips

- Refactor and Iterate
  - Paramaterize

☑ This build is parameterized

String Parameter

Name: OVF_BUILD_FOLDER

Default Value: skyhawk-trunk-${BUILD_NUMBER}

String Parameter

Name: APPLIANCE_BUILD_NUMBER

Default Value: ${BUILD_NUMBER}

String Parameter

Name: HTMLPATHROOT
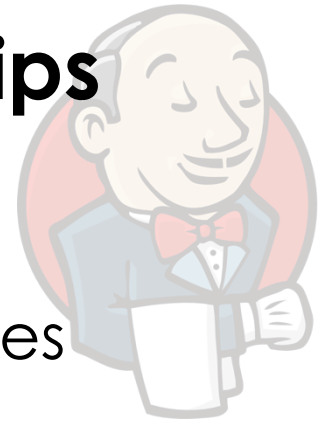
Default Value: file://///builds.aus.amer.dell.com/builds$/hudson/
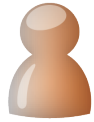
Reusability and Maintainability Tips

- Refactor and Iterate
  - Leverage new plugins and technologies

```
BVTApplianceLogs.template
1   <%
2   def env = System.getenv()
3   def parameters = build.getBuildVariables()
4   // if  parameter not found, then set to defaults for usage in script testing
5   def pathLeaf = parameters['OVF_BUILD_FOLDER'] ?: 'awk-m1-594'
6   try { pathLeaf = build.environment.expand(pathLeaf) } catch (Exception ex) {}
7   def pathRoot
8   def htmlPathRoot = parameters['HTMLPATHROOT'] ?: 'file://///builds.aus.amer.dell.com/builds$/hudson
9   if (env['OS'] && env['OS'].toUpperCase().contains('WINDOWS'))
10  {
11      // println 'setting windows os specific parameters'
12      pathRoot = parameters['PATHROOT'] ?: '\\\\builds\\builds\$\\hudson\\
13  } else {
14      // println 'setting linux specific paramete~~'
15      pathRoot = parameters['PATHROOT'] ?: '/mnt/awk/'
16  }
28  try {
39          applianceLogsDirName = "/Appliance_Logs"
40      }
41  } catch (Exception ex) {
42  }
43  %>
44  <A HREF="${htmlPathRoot}${pathLeaf}/${workflowDirName}${applianceLogsDirName}">BVT Appliance Logs</A>
```
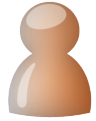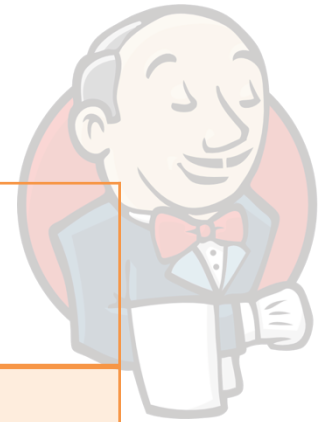
Individual Goals

- Enjoy your work – automation is fun!

- Keep your job – add value

- Earn a place at the table for build automation

- Learn and Apply

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