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(even then, some OpenOffice platforms may require you to do outline -> select all -> and pick the font. But hey, it's free...) Welcome! If you want to follow along, borrow a flash drive, copy the contents to your drive, and see the **README**. Or, download from: thewoolleyweb.com/ ci for the web 2.0 guy or gal

CI for the Web 2.0 /G(uy|al)/

Obligatory Boiler Plate



Chad Woolley thewoolleyman @ gmail.com

Pivota

.COM

Who are YOU? CI? Linux? Virtualization? Java? Ruby? **JsUnit? Selenium?**



Continuous Integration

Martin Fowler -Seminal Cl Article

Running all **vour tests** on every commit

Automatically



Takahashi Method == Big Font!

Focused on how to install and make everything work together, not on details of how to use the tools

Agenda:

1. Code: The simplest tutorial that could **POSSIBLY work**

Coding Tasks Outline

A. Install LINUX ON VMWare

B. Install Prereqs: ruby, java, mysql, svn, ant, alternate browser

C. Create sample Ruby on Rails Project

D. cruisecontrol.rb setup

E. JsUnit Setup

F. Selenium Setup

2. Gettin' Fancier

3. Gotchas

4. Questions



Cross-Platform, **Mostly*** Free

* VMware is not free on all platforms

VIVATE

Parallels is a Virtualization Alternative

Or, you can skip Virtualization and install Ubuntu directly on a spare PC. Just burn the ISO image to a CD.

Ubuntu Linux

cruisecontrol.rb
JSUnit

Selenium

There is a lot of material in this presentation

We will move FAST

Maybe too fast for you to follow along during the preso (sorry!)

But it's all on the slides

You can yell "Bingo" if you finish it before l do.

Intended to be comprehensive, easily repeatable, generic, crossplatform

Contains everything* you need to try this on a real project

* "everything" except the stuff that doesn't work on your project or environment. Error messages and Google are your friend :)

As a matter of fact, it almost certainly won't work perfectly for you. Integrating this stuff is hard, and new problems arise as tools and libraries evolve. Embrace the bleeding cutting edge, keep a positive attitude, and help fix bugs.

It's OK to sit back and watch

Try it at your home or workplace, at your own pace



No Hand Wavind

(Warning: Obligatory lame attempt at humor coming up)

Their WILL be

typos!

You down with OCD?

Then VOU'II know me!

Just please don't be "That Guy" (or Gal)!

You know, "That Guy" who stands up and wants to expound on irrelevant minutiae during the middle of a presentation...

Nitpicks and Linux hints Welcome...

...over beer, **AFTER the** presentation

...but seriously, if you are a bit OCDish, you might make a good Cl G(uy|al) - because there's a lot of moving parts that all have to integrate...

...Continuously!

1. Time to Code!

A. Install LINUX ON VMWare

No time to install Linux live, but VMWare and images are on **USB Keys**

My Barebones Linux VM Setup:

Base: VMWare on Macbook Pro 17" Ubuntu 7.04 desktop VM from ISO VMware Tools installed

Optional: Change resolution (1680x1050) Mouse Acceleration and Sensitivity Terminal scrollback

Everything should work on pretty much any modern Unix distro

Following are screenshots and instructions to set up basic Ubuntu on VMware

We will skip them for now, but you can use them as a **guide when you** try it later

Original screenshots in /presentation **/screenshots if** these are too small to read

VMware Mac Setup: /presentation /screenshots /01a_mac_vmware fusion screenshots

01_Virtual_Machine_Library.png

000	Virtual Machine Library
	Virtual Machines:
	Ubuntu1.vmx
	Boot Camp partition
	Ubuntu.vmwarevm
VMware Fusion beta	
	New Download Settings Run

02_Create_New_Virtual_Machine.png

000	New Virtual Machine Assistant
Introduction	Create New Virtual Machine
Operating System	The Virtual Machine Assistant will help you create a virtual
Name	machine.
Virtual Hard Disk	Virtual machines are self contained, portable computers that allow you to run Windows or other x86 operating systems side-
Windows Easy Install	
Finish	by-side with Mac OS X with near-native performance.
	Once the virtual machine has been created you will need to install an operating system from your own installation disc.
	To get started, click Continue.
	Cancel Go Back Continue
03_Choose_Operating_System.png

itroduction	Choose Operating System					
Operating System	Select the operating system you will install in this virtual					
Name	machine.					
Virtual Hard Disk						
Finish	Operating System: Linux					
	Version: Ubuntu					

04_Name_and_Location.png

ntroduction	Name and Location
perating System	Colort a name for the virtual machine and choose the
lame	folder where this virtual machine will be created.
irtual Hard Disk	
inish	Save as: ContinuousIntegration Where: Virtual Machines

05_Virtual_Hard_Disk.png

000	New Virtual Machine Assistant
Introduction Operating System Name Virtual Hard Disk Finish	 Virtual Hard Disk The virtual hard disk is just a file on your computer, which will start small and then grow larger as you add applications and files to your virtual machine. Disk size: 4.00 € GB This is the maximum capacity of the virtual machine's hard drive. Advanced disk options
	Cancel Go Back Continue

06_Finish.png

000	New Virtual Machine Assistant
Introduction Operating System Name Virtual Hard Disk Finish	 Finish The configuration of the virtual machine is now complete. The next step is to install Ubuntu in the virtual machine. You may start the installation now, which requires the linux installation disc, or save the virtual machine and install later. Start virtual machine and install operating system now Use operating system installation disc Use operating system installation disc image file: Ubuntu-7.04-desktop-i386.iso
	Cancel Go Back Finish

VMware Win Setup: /presentation /screenshots /01b win vmware server screenshots

01_VMware_Server_Console.PNG



02_Connect_To_Host.PNG

🚟 VMware	Server Console - Connect to Host				
VMwa	VMware Server Console				
	Select the VMware host that you want to connect to. To access virtual machines on the local computer you are using, select Local host. To access virtual machines on a networked host, select Remote host and enter the host name and a valid user name and password. local host local host local host local host				
	Host name:	~			
	User name:				
	Password:				
	OK Cancel				

03_New_Virtual_Machine.PNG



04_Virtual_Machine_Configuration.PNG



05_Select_a_Guest_Operating_System.PNG



06_Name_the_Virtual_Machine.PNG

New Virtual Machine Wizard	
Name the Virtual Machine What name would you like to use for this virtual machine?	
Virtual machine name Continuous_Integration Location C:\Virtual Machines\Continuous_Integration	Browse
< <u>B</u> ack <u>N</u> ext >	Cancel

07_Network_Type.PNG

New Virtual Machine Wizard	×			
Network Type What type of network do you want to add?				
Network connection				
 Use bridged networking Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network. 				
Use network address translation (NAT) Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.				
 Use host-only networking Connect the guest operating system to a private virtual network on the host computer. 				
C Do not use a network connection				
< Back Next > Cancel				

08_Specify_Disk_Capacity.PNG

New Virtual Machine Wizard	×
Specify Disk Capacity How large do you want this disk to be?	
Disk capacity This virtual disk can never be larger than the maximum capacity that you set here. Disk size (GB): ④ Allocate all disk space now. By allocating the full capacity of the virtual disk, you enhance performance of your virtual machine. However, the disk will take longer to create and there must be enough space on the host's physical disk. If you do not allocate disk space now, your virtual disk files will start small, then become larger as you add applications, files, and data to your virtual machine. Split disk into 2 GB files	t
< <u>B</u> ack Finish Cancel	

Mac/Win Ubuntu VM Setup: /presentation /screenshots /02 ubuntu vm setup screenshots

01_Start_or_Install_Ubuntu.png



02_Install_Icon.png



03_Welcome.png



04_Where_are_you.png

000	ContinuousIntegration	\bigcirc
Suspend Take Snapshot	Revert to Snapshot	
Applications Place	es System 🕹 🎧	🗐 🗐 Thu Jul 26, 5:03 AM 😈
Examples	La Install	
	Where are you?	
Install	Select a city in your country and time zone. If the indicated current time is incorrect even after selecting the correct time zone, you can adjust it after rebooting into the installed system.	
	Salacted ragion: United States	
	Selected filly.	
	Time zone: MST (GMT-7:00) Current time: 10:03:01 PM	
	Step 2 of 7	ward
🔳 🔔 Install		
To direct input to this v	virtual machine, click inside the window.	Ý Ý Ý 🔕 🗐 ↔ 🌒

05_Keyboard_Layout.png

00	🗟 Contin	uou	Integration	\bigcirc
Suspend Take Snapshot	Revert to Snapshot Settings			Unity Full Screen
Applications Place	s System 🥘 🖓			🕪 Thu Jul 26, 5:04 AM
Examples	Keyboard layout Which layout is most similar to your keyboard? Slovakia Slovenia South Africa Spain Sri Lanka Sweden Switzerland Syria Tajikistan Thailand Turkey U.S. English Ukraine United Kingdom Uzbekistan Vietnam You can type into this box to test your new keyboard	tall d lay	U.S. English U.S. English - Alternative international (former us_i U.S. English - Classic Dvorak U.S. English - Dvorak U.S. English - International (with dead keys) U.S. English - Left handed Dvorak U.S. English - Macintosh U.S. English - Right handed Dvorak U.S. English - Russian phonetic	nt
	Step 3 of 7		Cancel Cancel Corward	
🗐 🔔 Install				
To direct input to this y	irtual machine, click inside the window.			t t t 🕡 🗖 💬 🎒

06_Prepare_disk_space.png

000	ContinuousIntegration	\Box
Suspend Take Snapsho	t Revert to Snapshot Settings	Unity Full Screen
C Applications Place	es System 🎯 🎧 🖉 🗐	Thu Jul 26, 5:05 AM 🕑
Examples	📤 Install 🗕 🗆 🗙	
	Prepare disk space	
CD	How do you want to partition the disk?	
	Ouided - use entire disk	
Install	● SCSI1 (0,0,0) (sda) - 4.3 GB VMware, VMware Virtual S	
	O Manual	
	Step 4 of 7 X Cancel A Back	
🔳 🏩 Install		
To direct input to this	virtual machine, click inside the window.	' 🜵 🜵 💿 🔳 🖘 🌒 🍃

07_Migrate_Documents_and_Settings.png

000	😼 ContinuousIntegration	\Box
Suspend Take Snapshi	hot Revert to Snapshot Settings	Unity Full Screen
Applications Place	aces System 🥹 🔄 🕢 🖉 🖏 Thu J	jul 26, 5:06 AM 🕑
Examples	install 🗕 🗆 🗙	
	Migrate Documents and Settings	
Install	Select any accounts you would like to import and fill in the form below for each one. The documents and settings for these accounts will be available after the install completes.	
	a you do not wan to import any decounts, select nothing and go to the next page.	
	There were no users or operating systems suitable for importing from.	
	Create a user to import the selected account into:	
	Fuli Name:	
	Confirm:	
	Step 5 of 7	
🔳 🏩 Install		
To direct input to this	is virtual machine, click inside the window.	∲ 💿 🗋 ↔ ��) //

08_Who_are_you.png

000	ContinuousIntegration	\bigcirc
Suspend Take Snapsho	t Revert to Snapshot Settings	Unity Full Screen
Applications Plac	es System 🥮 🏹 👔	🛿 에 Thu Jul 26, 5:07 AM
	Install	
Examples	Who are you?	
Install	What is your name? Continuous Integration What name do you want to use to log in? i i if more than one person will use this computer, you can set up multiple accounts after installation. Choose a password to keep your account safe. image: the same password to keep your account safe. image: the same password twice, so that it can be checked for typing errors. What is the name of this computer? ci This name will be used if you make the computer visible to others on a network.	
🐨 🔅 Install		
To direct input to this	virtual machine, click inside the window	🚺 🚺 🚺 🚺 🚺
to uncer input to this	internet, each nouse the influent	

09_Ready_to_install.png

000	ContinuousIntegration	0
Suspend Take Snapsho	t Revert to Snapshot Settings	Unity Full Screen
👶 Applications Plac	es System 🥹 🔄 🕢	🛿 🗐 Thu Jul 26, 5:08 AM
	Install	
Examples	Ready to install	
<u>\$</u>	Your new operating system will now be installed with the following settings:	
Install	Language: English Keyboard layout: U.S. English - Macintosh Name: Continuous Integration Login name: ci Location: America/Phoenix Migration Assistant:	
	If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually. WARNING: This will destroy all data on any partitions you have removed as well as on the partitions that are going to be formatted. The partition tables of the following devices are changed: SCSI1 (0,0,0) (sda) The following partitions are going to be formatted: partition #1 of SCSI1 (0,0,0) (sda) as ext3 partition #5 of SCSI1 (0,0,0) (sda) as swap	
	Advanc	ed]
	Step 7 of 7	tall
🔳 🔔 Install		
To direct input to this	virtual machine, click inside the window.	ÝÝÝÝ (O) 🗐 (-> (1)) //

10_Installing_system.png

000	ContinuousIntegration	0
Suspend Take Snapshot Revert to Snapshot	iettings	Unity Full Screen
📢 Applications Places System 🥘 <table-cell></table-cell>		💻 剩 Thu Jul 26, 5:08 AM ⊍
Examples		
	installing system	
	Installing system	
	27%	
	Copying files	
🗐 🔔 Installing system		- 3
To direct input to this virtual machine, click ins	ide the window.	Ý Ý Ý 💿 🗐 💮 🌒

11_Installation_complete.png

000	ContinuousIntegration	
Suspend Take Snapshot Revert to Snapshot	Settings	Unity Full Screen
爻 Applications Places System 🥹 🖂 🧉		💂 剩 Wed Jul 25, 10:16 PM ⊍
Examples		
	Installation complete	
	Installation is complete. You need to restart the computer in order to use the new installation. You can continue to use this live CD, although any changes you make or documents you save will not be preserved. Be sure to remove the CD when restarting the computer, otherwise it will start back up using this live CD rather than the newly-installed system.	
	Continue using the live CD Restart now	
🗐 🔔 Installation complete		
To direct input to this virtual machine, click in	side the window.	Ý Ý Ý 💿 🗐 🐡 🌒 🎵

12_VMware_Tools_reminder.png



You do not appear to be running the VMware Tools package inside this virtual machine.

The package might be necessary for your guest operating system to run at resolutions higher than 640x480 with 16 colors. The package provides significant performance benefits as well. To install it, choose Virtual Machine > Install VMware Tools... after your guest operating system has finished booting.

If you like, VMware Fusion can remind you to install the VMware Tools package when you power on. Select OK to enable the reminder.

Never show this dialog again



13_Cancel_package_manager.png



To direct input to this virtual machine, click inside the window.

14_Virtual_Machine_Menu_Install_VMware_Tools.png

Settings Install VMware Tools	₩E s
Take Snapshot Revert to Snapshot	nine 第 企業 T
Discard Snapshot Send Ctrl-Alt-Del Grab Input	ЖG
✓ Powered On Shut Down Guest Suspend Guest	
Restart Guest CD/DVD Hard Disk	Þ
Network Sound USB	* *

15_Installing_the_VMware_Tools_package.png



Installing the VMware Tools package will greatly enhance graphics and mouse performance in your virtual machine.

WARNING: You cannot install the VMware Tools package until the guest operating system is running. If your guest operating system is not running, choose Cancel and install the VMware Tools package later.



At this point, you may need to reboot (System -> Quit -> Restart) in order for the VMware Tools CD image to mount correctly, especially if you already have the Ubuntu ISO image mounted.

16_Open_VMWare_Tools_Image.png



17_Extract_VMware_Tools.png

<u>.</u>	Evolution Mail Read and write emails		cdrom0 - File Br D <u>B</u> ookmarks <u>H</u> elp	owser	_
VMware Tools	Tools-1.0.3-44356.tar.gz [re	ad only]		Contraction Reload Home	Computer
New Open E	xtract Add Files Add Fo	der View File	pols	Q 100% Q	View as Icons 💠
👍 Back 📦 🏠 💼 Name	2 (i)	Extract	Create Fo <u>l</u> der	VMwareTools-1.0.3- 44356.tar.gz	
i vmware-tools-distrib	Places i ci Desktop File System Floppy Drive	Name	 ✓ Modified Today 04/15/2007 	1 MB)	
	VMware Tools	Actions			
	○ <u>A</u> ll files ● <u>S</u> elected files	✓ Re-create ✓ Overwrite	folders existing files		
3556 files (44.3 MB)	O Eiles:	Do not e <u>x</u> t Password:	ract older files		
		8	<u>Cancel</u>		

18_Applications_Accessories_Terminal.png



Install VMware Tools (Optional): \$ cd ~/vmware-tools-distrib \$ sudo ./vmware-install.pl # enter password for sudo # hit enter repeatedly to accept defaults for all prompts # reboot (System -> Quit -> Restart)

Opening an existing VM Image Copy: /presentation /screenshots /03 virtual machine cop

01_Browse_for_a_Virtual_Machine.PNG

📅 Local host - VMware Server Console				
File Edit View Host VM Power Snapshot Windows	Help			
Inventory ×	合 Home	-		×
Open Virtual Machine		× Console		
To open a virtual machine in the console, select from the list below a	nd click OK.	cal host running VM	ware Server 1.0.3	
To open a virtual machine that is not in the list, click Browse and sele configuration file from a local or network drive.	ect a virtual machine	onsole lets you connect to	virtual machines that run or	NMware Server
VM name Configuration file	ual Machine			? ×
There are currently no virtual machines availa	🔁 Ubuntu_Base	-	G 🖻 🖻 🖽	
Recent Recent Desktop My Documents My Computer My Network Places	File name: Files of type:	Ubuntu.vmx VMware Configuration Files (*.vmx)		e. t Open Cancel
02a_Mac_Virtual_Machine_Copy.png



02b_Win_Virtual_Machine_Copy.png

Jbuntu_Base - Yirtual Machine	
2	The location of this virtual machine's configuration file has changed since it was last powered on.
	If the virtual machine has been copied, you should create a new unique identifier (UUID). If it has been moved, you should keep its old identifier.
	If you are not sure, create a new identifier.
	What do you want to do?
	Create
	O Keep
	C Always Create
	🔿 Always Keep
	OK Cancel

03_Missing_ISO_CDROM_Image.PNG

Ubuntu_Base - Virtual Machine



File "C:\download\iso\ubuntu-7.04-desktop-i386.iso" does not exist and therefore cannot be connected as a CD-ROM image. Virtual device ide1:0 will start disconnected.

х

OK.

Other Ubuntu Tweaks (Optional):

- * System -> Preferences -> Screen Resolution
- * System -> Preferences -> Mouse
- * Drag Applications -> Accessories -> Terminal icon to quick launch area
- * Terminal -> Edit -> Current Profile -> Scrolling -> Scrollback = 99999
- * Ctrl +, Ctrl in Terminal to change font size

B. Install Prerequisites

Legend \$ == shell input # == comment or instructions (nothing) == editor input or stdin

Example: # sudo should prompt for a password unless you've sudo'd recently \$ sudo ls password # should get file list

We will keep everything in the home dir, or "~" You can put it wherever you want

Ruby Packaging on Ubuntu/Debian: Plan9 vs FHS and LSB == confusing

You can install ruby via apt-get, but building it from source is recommended.

Install Ruby from source: # install all prereqs/extensions in case you need them \$ sudo apt-get update \$ sudo apt-get install -y zlib1g zlib1g-dev \$ sudo apt-get install -y libssl-dev openssl \$ wget ftp://ftp.ruby-lang.org/pub/ruby/ruby-1.8.5.tar.gz \$ tar -zxvf ruby-1.8.5.tar.gz \$ cd ruby-1.8.5 \$ gedit ext/Setup # Uncomment all "non-Win" lines (all except Win32API and win32ole) by removing "#' \$./configure \$ make \$ sudo make install

Install RubyGems: \$ wget http://rubyforge.org/frs/download.php/20989/rubygem s-0.9.4.tgz \$ tar -zxvf rubygems-0.9.4.tgz \$ cd rubygems-0.9.4 \$ sudo ruby setup.rb Install Sun java: \$ sudo apt-get install -y sun-java5-bin # accept all prompts Install MySql (required by default Rails app): \$ sudo apt-get install -y mysql-server Install subversion: \$ sudo apt-get install -y subversion Install ant: \$ sudo apt-get install -y ant \$ sudo apt-get install -y ant-optional # By default, this uses Gnu java, not Sun's...

Install mozilla as an alternate browser # because jsunit will kill the browser it is testing # libgtk1.2 is a dependency \$ sudo apt-get install -y libgtk1.2 \$ wget http://ftpmozilla.netscape.com/pub/mozilla.org/mozilla/release s/mozilla1.7.13/mozilla-i686-pc-linux-gnu-1.7.13installer.tar.gz \$ tar -zxvf mozilla-i686-pc-linux-gnu-1.7.13installer.tar.gz \$ sudo mozilla-installer/mozilla-installer # install Navigator only \$ /usr/local/mozilla/mozilla &

Create Subversion Repo \$ svnadmin create repo

C. Create sample Ruby on Rails Project

Install Rails \$ sudo gem install rails --include-dependencies

Create a rails project \$ rails mysite \$ cd mysite

Create databases for rails project \$ mysql -u root mysql> create database mysite_development; mysql> create database mysite_test; mysql> create database mysite_production; # (prod needed because cruise complained if it was not there) mysql> exit Hack rails database.yml to match debian defaults \$ gedit config/database.yml # add the following entry to all three databases socket: /var/run/mysqld/mysqld.sock # NOTE: Sometimes, Rails will do this for you automatically...

Create a rails migration and db table \$ ruby script/generate migration CreateUserTable \$ gedit db/migrate/001_create_user_table.rb def self.up create_table "users" do |t| t.column "name", :string end

end

def self.down drop_table "users" end \$ rake db:migrate Remove default index.html and create a page \$ rm public/index.html \$ ruby script/generate scaffold User \$ gedit test/functional/users_controller_test.rb # change "users(:first)" to "users(:one)" – there should only be one occurrence Test rails site \$ rake # should pass all tests \$ ruby script/server # New Terminal Tab: File -> Open Tab or Ctrl-Shift-T # should be in mysite dir \$ firefox http://localhost:3000/users # create a user Import site into subversion # change back to home dir (~) \$ cd # remove temp files we don't want to check in \$ rm -rf mysite/log/* \$ rm mysite/db/schema.rb \$ rm -rf mysite/tmp \$ svn import mysite file:///home/ci/repo/mysite -m ''import'' \$ rm -rf mysite

\$ svn co file:///home/ci/repo/mysite mysite

Set svn:ignores # ignore all temp files, to have a clean workspace \$ cd mysite \$ export EDITOR=gedit \$ svn propedit svn:ignore . tmp logs \$ svn propedit svn:ignore log *

schema.rb \$ svn commit -m "ignores" \$ cd

D. cruisecontrol.rb setup

cruisecontrol.rb is still new. We will use a recent build, which has many features not found in the 1.1.0 release

Check http://cruisecontrolrb.thought works.com/projects for a recent, successfully building revision. We'll use rev 521

Check out a recent build of CruiseControl.rb \$ svn checkout http://cruisecontrolrb.rubyforge.org/svn/trunk/@521 cc

```
Do a temporary hack to fix a bug in cc.rb rev 521
$ cd cc
$ mkdir projects
$ echo '1' > projects/data.version
$ cd
```

Set up project in cruisecontrol \$ cd cc \$./cruise add MySite --url file:///home/ci/repo/mysite \$./cruise start

View cruisecontrol web page # Ctrl-Shift-T for new Terminal tab \$ firefox localhost:3333 # click MySite # Should be passing

Take this opportunity to familiarize yourself with cruisecontrol.rb. It's not covered here ;) http://cruisecontrolrb .thoughtworks.com/

Add cruise task to Rakefile # cd to Rails project dir \$ cd ~/mysite \$ gedit Rakefile # Add cruise task to bottom after 'requires': task :cruise do Rake::Task['test'].invoke end \$ svn commit Rakefile -m "add cruise task"

Check cruise webpage, should still be passing
Tweak firefox for automation # open firefox, navigate to 'about:config' # search for 'browser.sessionstore.resume_from_crash' # toggle to false # Preferences - Tabs - uncheck "warn when closing multiple tabs' # Maybe turn off update prompts too...

E. JsUnit Setup

Download and Unzip JsUnit \$ cd \$ wget http://easynews.dl.sourceforge.net/sourceforge/jsunit /jsunit2.2alpha11.zip \$ unzip jsunit2.2alpha11.zip # copy junit.jar file to Ant lib dir (required by Ant) \$ sudo cp jsunit/java/lib/junit.jar /usr/share/ant/lib/

Copy jsunit to your app and check in \$ cd mysite/public/javascripts \$ mv /home/ci/jsunit. \$ svn add jsunit \$ export EDITOR=gedit \$ svn propedit svn:ignore jsunit/logs # add * to ignore list \$ svn propedit svn:executable jsunit/bin/unix/startfirefox.sh # enter "true" \$ svn commit -m "add jsunit"

Create a jsunit test \$ mkdir test pages \$ gedit test pages/prototype_test.html <html> <head> <script language="JavaScript" type="text/javascript" src="../jsunit/app/jsUnitCore.js"></script> <script language="JavaScript" type="text/javascript" src="../prototype.js"></script> <script language="javascript"> function testPrototypeWordSplit() { string = 'one two three'; assertEquals('one', (\$w(string))[0]); </script> </head> <body></body> </html>

Run the jsunit test manually from browser and commit

- \$ cd
- \$ cd mysite
- \$ ruby script/server # unless you still have it running

\$ firefox http://localhost:3000/javascripts/jsunit/testRunner.ht ml # Enter this in the "Run" field and click "Run": http://localhost:3000/javascripts/test_pages/prototyp e_test.html \$ svn add public/javascripts/test_pages \$ svn commit -m "jsunit test"

Take this opportunity to familiarize yourself with JsUnit and JsUnit Server. It's not covered here ;) http://jsunit.net/

- "Punt" and make a manual jsunit_start_server script # Because automated process management is not TSTTCPW for this tutorial, and it's hard
- # This is also easily ported to a batch file on windows \$ cd mysite
- \$ gedit script/jsunit_start_server.sh ant -f
- /home/ci/mysite/public/javascripts/jsunit/build.xml -DbrowserFileNames=
- /home/ci/mysite/public/javascripts/jsunit/bin/unix/star t-firefox.sh -Dport=8081 start_server

Check in jsunit start server script and leave it running \$ svn add script/jsunit start server.sh \$ svn propedit svn:executable script/jsunit start server.sh # add 'true' line \$ script/jsunit start server.sh # ignore warning about tools.jar # make sure it starts and leave it running # ctrl-c if you want to kill it # open a new terminal tab \$ svn ci -m "add jsunit start script"

Add jsunit task \$ gedit Rakefile task :cruise do Rake::Task['test'].invoke Rake::Task['jsunit_distributed_test'].invoke end

task : jsunit distributed test do output = `ant -f public/javascripts/jsunit/build.xml -Durl=http ://localhost:8080/jsunit/jsunit/testRunner.html?testPa ge=/jsunit/test pages/prototype test.html -DremoteMachineURLs=http://localhost:8081 -DresourceBase=public/javascripts distributed test` raise "JsUnit Failed:\n" + output unless **\$?.success?** puts "JsUnit tests passed" end

- Commit jsunit task and check cruise # Open cruise webpage under mozilla # jsunit will kill firefox, so we need a different browser \$ /usr/local/mozilla/mozilla http://localhost:3333 # if you want, add a quick launch for mozilla: right click -> add to panel -> custom application launcher
- \$ svn commit Rakefile -m "add jsunit_distributed_test
 task"
- # Check cruise webpage, should still be passing

F. Selenium Setup

Selenium 0.8.1 is proven, 0.9.0 has had problems. Latest unreleased version is reported to be OK.

Download Selenium Remote Control \$ cd \$ wget http://release.openqa.org/selenium-remotecontrol/0.8.1/selenium-remote-control-0.8.1.zip \$ unzip selenium-remote-control-0.8.1.zip

Make a manual selenium start server script \$ cd mysite \$ cp /home/ci/selenium-remote-control-0.8.1/server/selenium-server.jar lib \$ svn add lib/selenium-server.jar \$ gedit script/selenium start server.sh java -jar /home/ci/mysite/lib/selenium-server.jar -interactive \$ svn add script/selenium start server.sh \$ export EDITOR=gedit \$ svn propedit svn:executable script/selenium start server.sh # add 'true' line \$ script/selenium start server.sh # make sure it starts and leave it running, ctrl-c to kill it **#** Open new terminal tab

\$ svn ci -m "add selenium start script and jar"

Set up selenium test dir and copy ruby API file \$ cd mysite \$ mkdir test/selenium \$ cp ~/selenium-remote-control-0.8.1/ruby/selenium.rb test/selenium Create selenium test stub \$ gedit test/selenium/user_test.rb require 'test/unit' require File.expand_path(File.dirname(__FILE__) + '/selenium')

```
class UserTest < Test::Unit::TestCase
  def setup
  @selenium =
  Selenium::SeleneseInterpreter.new("localhost", 4444, "*firefox
/usr/lib/firefox/firefox-bin", "http://localhost:3001/", 10000);
  @selenium.start
  end
```

def teardown @selenium.stop end

```
def test_user_add_flow
end
end
```

Fill in selenium test stub
\$ gedit test/selenium/user_test.rb
def test_user_add_flow
timestamp = Time.new.to_s
user_name = 'joe ' + timestamp
@selenium.open "http://localhost:3001/users"
@selenium.click "link=New user"
sleep 2 # <- Sleeping is bad! Use a wait_for loop...
@selenium.type "id=user_name", user_name
@selenium.click "commit"</pre>

sleep 2
assert @selenium.is_text_present(user_name)
end

```
Create selenium_test rake task including start and stop of
server
$ gedit Rakefile
task :cruise do
```

```
Rake::Task['selenium_test'].invoke
end
```

```
task :selenium_test do
  begin
   process = IO.popen("ruby
/home/ci/cc/projects/MySite/work/script/server --port=3001")
   output = `ruby test/selenium/user_test.rb`
   raise "Selenium Failed:\n" + output unless $?.success?
   puts "Selenium tests passed"
   ensure
   Process.kill(9,process.pid)
   end
end
```

Check in and check cruise \$ svn add test/selenium \$ svn commit -m "selenium test" # check cruise, it should run everything and be green

Break tests and fix them! # cause ruby/jsunit/selenium failures, and check them in # see cruise go red, then fix them # click links for ruby/selenium failures # there's a test bug! (next page after too many tests) # good to drop DB before each CI run... # This naive implementation has return code bugs (crash if webrick already running)

Same concept for other tools/ Languages/ CI Engines

Coding Done!

2. Gettin' Fancier

Handwaving Now

Multiplatform

Multibrowser



Virtualization: One Box, **Three Platforms** mac/win/linux

Automate and Test Deployment Process

Test Rollback process!

Configuration Management / Version Control

Auto-taq Green Builds

Automatically pre-create Release Branches

Build ALL active branches under Cl

Multiple Libraries/ **Projects**
Dependencies Among Common Libraries and Projects

Dependency modifications should trigger builds of all dependents

Consistent Tags/Baselines Among **Projects:** Naming/Usage

Versioning of Dependencies (or not):

Mainline / Snapshot / trunk / HEAD vs baselines / tags

Different Builds for Different **Environments:** Development vs **Demo/Prod**

Publishing Artifacts/ Dependencies:

Deployed (Jars/Gems) vs SCM (svn:externals)

Hackability vs **Stability: Fear** should not inhibit improvement of **common libraries**

Optimism vs Pessimism: Do What dependency versions are you deploying to prod?

Nirvana: Green tags/artifacts instantly used across all dev environments, all deploys have known, green, stable, baselined dependencies

Suites: You can have more than one!

It's all about Feedback

Timely vs Comprehensive

Fast

VS

Thorough

Commit-Triggered vs Scheduled

Minimize Checkout Ime

Get HUGE Dependencies and binaries out of Source Control

RubyGems / Maven VS svn:externals / **CVS** modules

Metrics

Code Coverage -Emma/rcov

Mutation Testing Heckle, Jester

red/green trends

Build Length Trends

Notification

Information Radiator(s)







Ambient Orb

13" CRT with red/green background

Whatever people will pay attention to!

3. Gotchas

Random Gotchas / Mantras:

- * "It's not easy being Green"
- * Broken Windows are Bad ("Who cares, it's always red...")
- * False Negatives are Bad
- * Crying Wolf ("it failed for no reason")
- * "Intermittent" failures (but it's not intermittent after you can reproduce it)
- * "Works Locally" (is your local environment the same as CI? Which one is Prod closer to???)
- * You can always "temporarily" disable a test in Cl
- * One disabled test is better than a red Cl
- * False Positives are Bad too being Green, when return code (echo \$?) from some step is not 0
- * Browser Settings (autoupdate, etc) Preventing Browser Close

4. Questions?

Chad Woolley

thewoolleyman @ gmail.com

thewoolleyweb.com/ ci_for_the_web_2.0_guy_or_gal