Continuous Integration with Jenkins, ANT, and MXUnit

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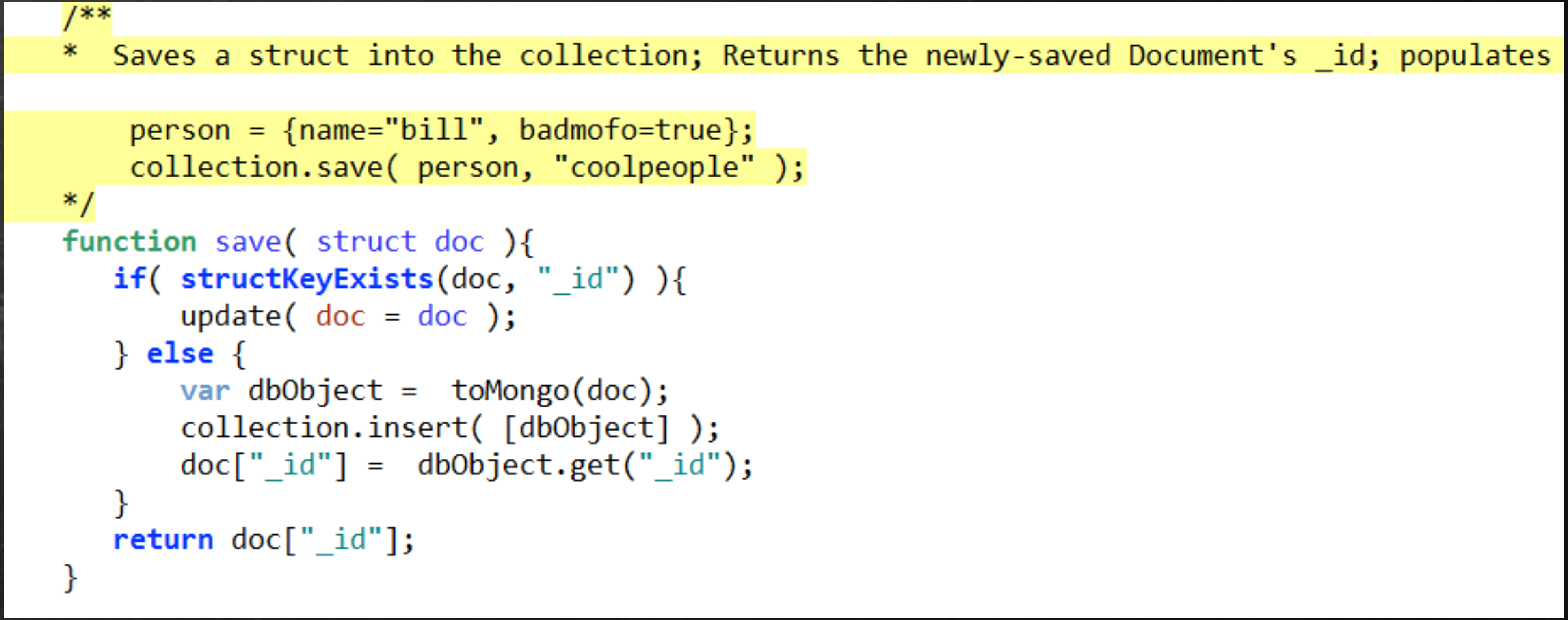
CFObjective 2011

Download this presentation at wiki.mxunit.org

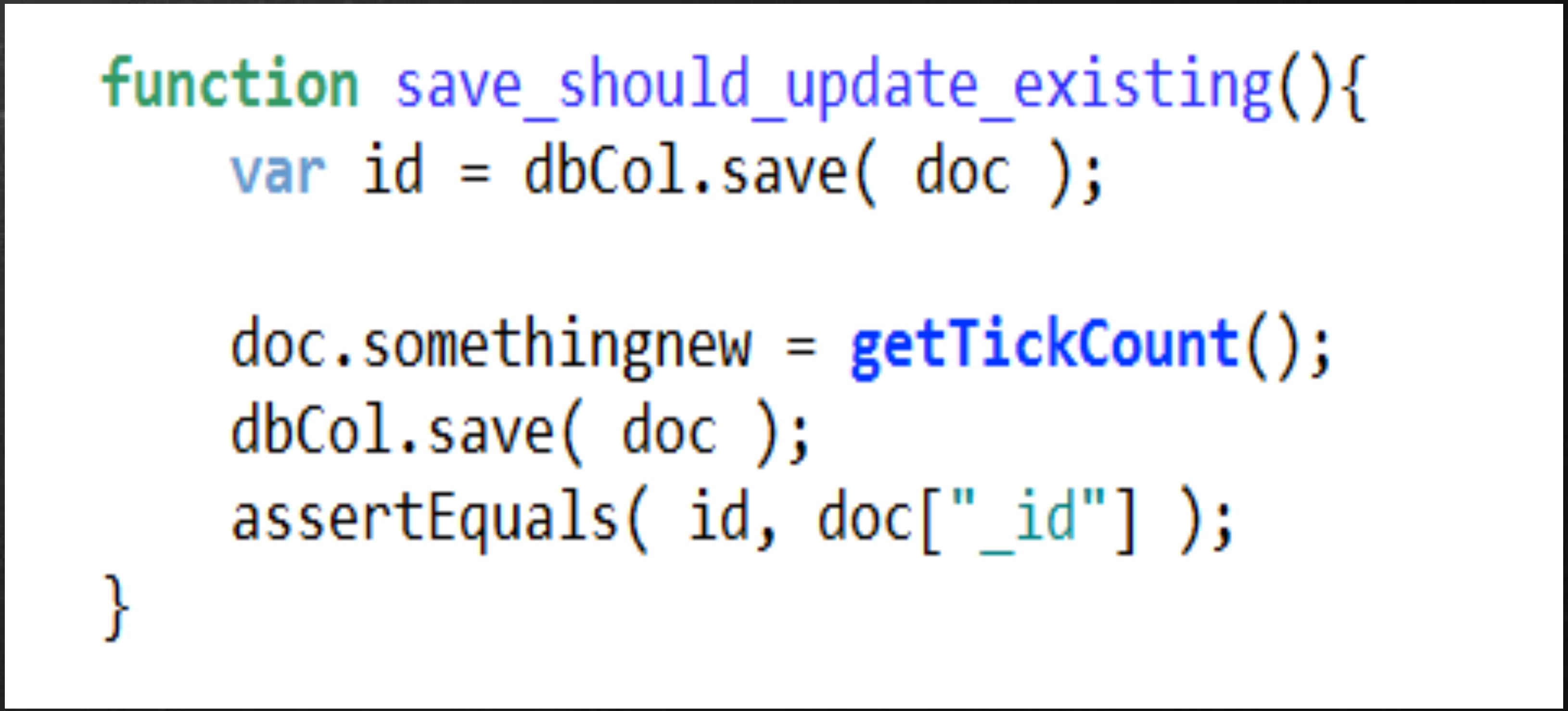
What is this?



```
/**
*  Saves a struct into the collection; Returns the newly-saved Document's _id; populates

    person = {name="bill", badmofo=true};
    collection.save( person, "coolpeople" );
*/
function save( struct doc ){
   if( structKeyExists(doc, "_id") ){
       update( doc = doc );
   } else {
       var dbObject =  toMongo(doc);
       collection.insert( [dbObject] );
       doc["_id"] =  dbObject.get("_id");
   }
   return doc["_id"];
}
```

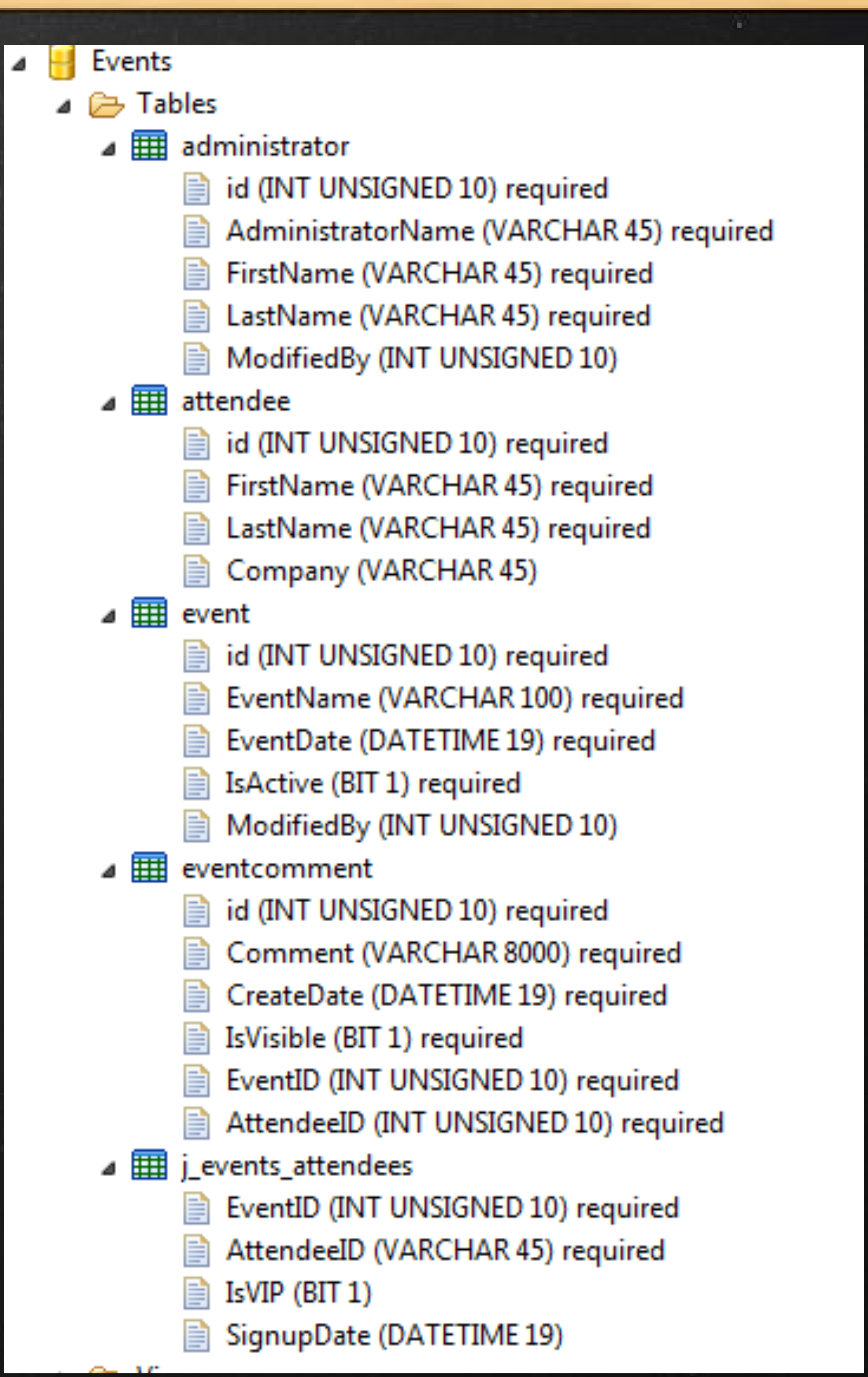
Now **impress** me...

What is this?



```
function save_should_update_existing(){
    var id = dbCol.save( doc );

    doc.somethingnew = getTickCount();
    dbCol.save( doc );
    assertEquals( id, doc["_id"] );
}
```

And this?

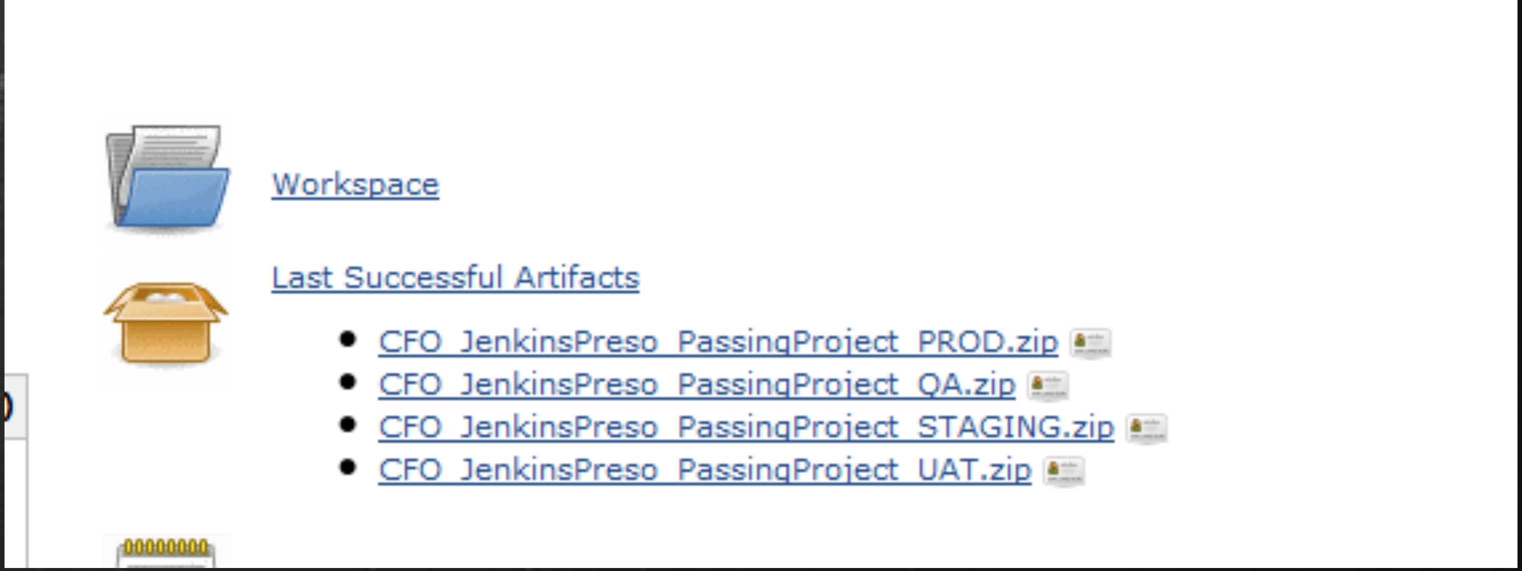


- Events
  - Tables
    - administrator
      - id (INT UNSIGNED 10) required
      - AdministratorName (VARCHAR 45) required
      - FirstName (VARCHAR 45) required
      - LastName (VARCHAR 45) required
      - ModifiedBy (INT UNSIGNED 10)
    - attendee
      - id (INT UNSIGNED 10) required
      - FirstName (VARCHAR 45) required
      - LastName (VARCHAR 45) required
      - Company (VARCHAR 45)
    - event
      - id (INT UNSIGNED 10) required
      - EventName (VARCHAR 100) required
      - EventDate (DATETIME 19) required
      - IsActive (BIT 1) required
      - ModifiedBy (INT UNSIGNED 10)
    - eventcomment
      - id (INT UNSIGNED 10) required
      - Comment (VARCHAR 8000) required
      - CreateDate (DATETIME 19) required
      - IsVisible (BIT 1) required
      - EventID (INT UNSIGNED 10) required
      - AttendeeID (INT UNSIGNED 10) required
    - j_events_attendees
      - EventID (INT UNSIGNED 10) required
      - AttendeeID (VARCHAR 45) required
      - IsVIP (BIT 1)
      - SignupDate (DATETIME 19)

Pop Quiz

Which of those 3 change?

Do your projects have this?

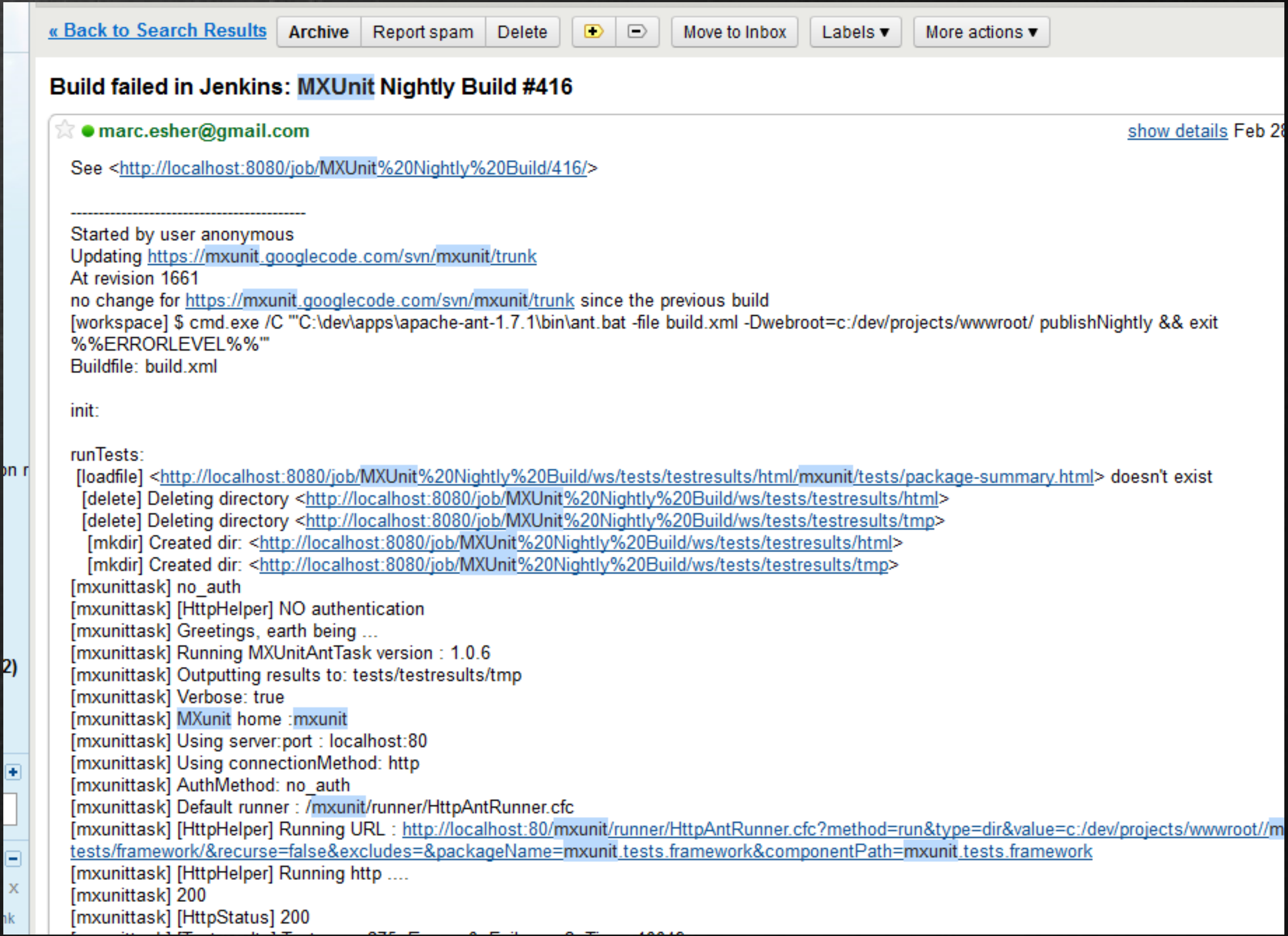


Workspace

Last Successful Artifacts

- CFO_JenkinsPreso_PassingProject_PROD.zip
- CFO_JenkinsPreso_PassingProject_QA.zip
- CFO_JenkinsPreso_PassingProject_STAGING.zip
- CFO_JenkinsPreso_PassingProject_UAT.zip

Or this?

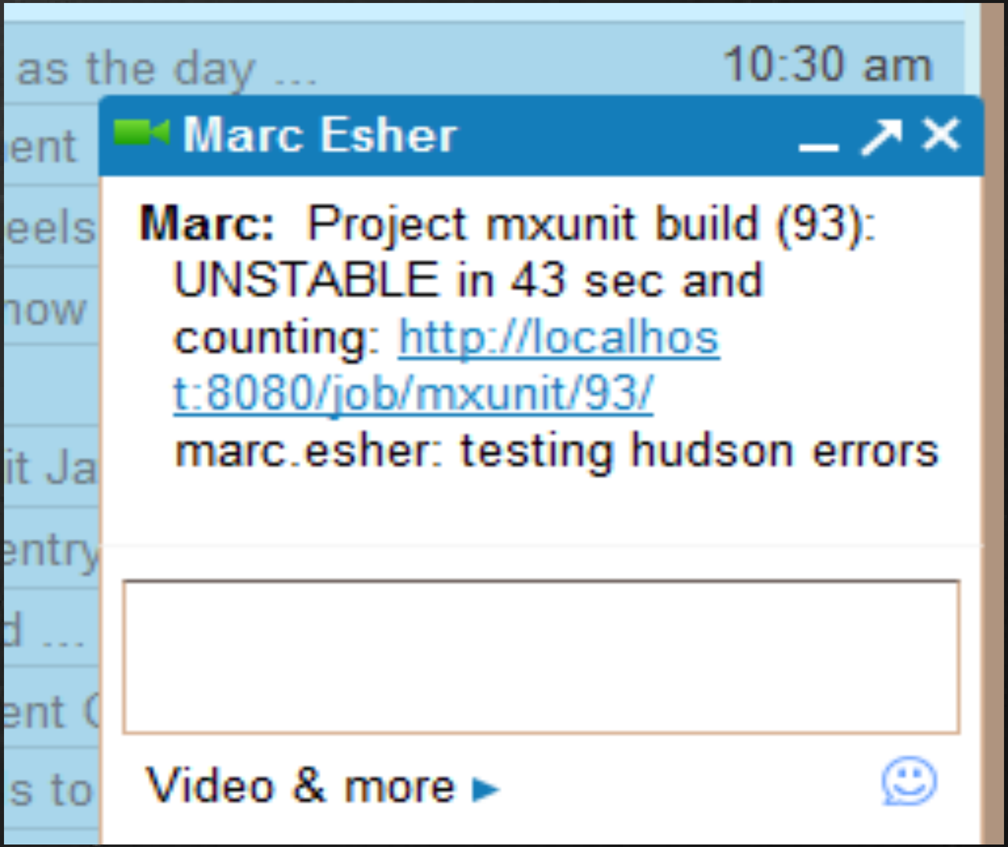


Build failed in Jenkins: MXUnit Nightly Build #416

marc.esher@gmail.com

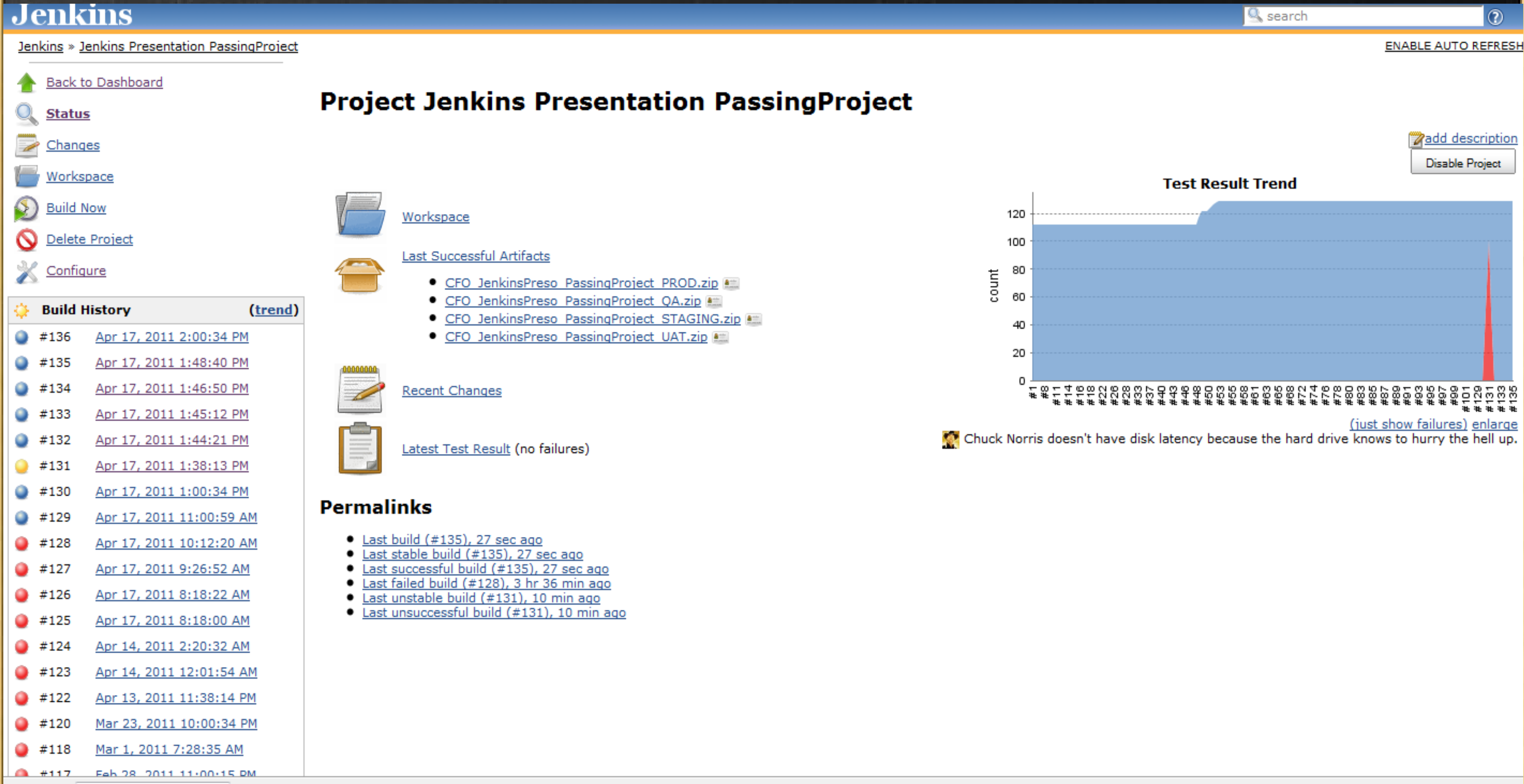
```
See <http://localhost:8080/job/MXUnit%20Nightly%20Build/416/>

------------------------------------------
Started by user anonymous
Updating https://mxunit.googlecode.com/svn/mxunit/trunk
At revision 1661
no change for https://mxunit.googlecode.com/svn/mxunit/trunk since the previous build
[workspace] $ cmd.exe /C '"C:\dev\apps\apache-ant-1.7.1\bin\ant.bat -file build.xml -Dwebroot=c:/dev/projects/wwwroot/ publishNightly && exit
%%ERRORLEVEL%%"'
Buildfile: build.xml

init:

runTests:
 [loadfile] <http://localhost:8080/job/MXUnit%20Nightly%20Build/ws/tests/testresults/html/mxunit/tests/package-summary.html> doesn't exist
  [delete] Deleting directory <http://localhost:8080/job/MXUnit%20Nightly%20Build/ws/tests/testresults/html>
  [delete] Deleting directory <http://localhost:8080/job/MXUnit%20Nightly%20Build/ws/tests/testresults/tmp>
   [mkdir] Created dir: <http://localhost:8080/job/MXUnit%20Nightly%20Build/ws/tests/testresults/html>
   [mkdir] Created dir: <http://localhost:8080/job/MXUnit%20Nightly%20Build/ws/tests/testresults/tmp>
[mxunittask] no_auth
[mxunittask] [HttpHelper] NO authentication
[mxunittask] Greetings, earth being ...
[mxunittask] Running MXUnitAntTask version : 1.0.6
[mxunittask] Outputting results to: tests/testresults/tmp
[mxunittask] Verbose: true
[mxunittask] MXunit home :mxunit
[mxunittask] Using server:port : localhost:80
[mxunittask] Using connectionMethod: http
[mxunittask] AuthMethod: no_auth
[mxunittask] Default runner : /mxunit/runner/HttpAntRunner.cfc
[mxunittask] [HttpHelper] Running URL : http://localhost:80/mxunit/runner/HttpAntRunner.cfc?method=run&type=dir&value=c:/dev/projects/wwwroot//m
tests/framework/&recurse=false&excludes=&packageName=mxunit.tests.framework&componentPath=mxunit.tests.framework
[mxunittask] [HttpHelper] Running http ....
[mxunittask] 200
[mxunittask] [HttpStatus] 200
```

How fast do you know **when something breaks?**



Marc: Project mxunit build (93): UNSTABLE in 43 sec and counting: http://localhost:8080/job/mxunit/93/
marc.esher: testing hudson errors

Wassssssuupppp?



Jenkins » Jenkins Presentation PassingProject

- Back to Dashboard
- Status
- Changes
- Workspace
- Build Now
- Delete Project
- Configure

Build History (trend)

🔵	#136	Apr 17, 2011 2:00:34 PM
🔵	#135	Apr 17, 2011 1:48:40 PM
🔵	#134	Apr 17, 2011 1:46:50 PM
🔵	#133	Apr 17, 2011 1:45:12 PM
🔵	#132	Apr 17, 2011 1:44:21 PM
🟡	#131	Apr 17, 2011 1:38:13 PM
🔵	#130	Apr 17, 2011 1:00:34 PM
🔵	#129	Apr 17, 2011 11:00:59 AM
🔴	#128	Apr 17, 2011 10:12:20 AM
🔴	#127	Apr 17, 2011 9:26:52 AM
🔴	#126	Apr 17, 2011 8:18:22 AM
🔴	#125	Apr 17, 2011 8:18:00 AM
🔴	#124	Apr 14, 2011 2:20:32 AM
🔴	#123	Apr 14, 2011 12:01:54 AM
🔴	#122	Apr 13, 2011 11:38:14 PM
🔴	#120	Mar 23, 2011 10:00:34 PM
🔴	#118	Mar 1, 2011 7:28:35 AM
🔴	#117	Feb 28, 2011 11:00:15 PM

Project Jenkins Presentation PassingProject

add description

Disable Project

Workspace

Last Successful Artifacts

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- CFO_JenkinsPreso_PassingProject_UAT.zip

Recent Changes

Latest Test Result (no failures)

Test Result Trend

(just show failures) enlarge

Chuck Norris doesn't have disk latency because the hard drive knows to hurry the hell up.

Permalinks

- Last build (#135), 27 sec ago
- Last stable build (#135), 27 sec ago
- Last successful build (#135), 27 sec ago
- Last failed build (#128), 3 hr 36 min ago
- Last unstable build (#131), 10 min ago
- Last unsuccessful build (#131), 10 min ago

This Presentation is NOT:

An introduction to unit testing

A 50-minute explanation of how gull-dern geewilikers easy all of this is

This Presentation is:

An attempt to demonstrate how learning this stuff can:

- help you identify broken windows quicker and easier
- provide increased transparency to your projects
- enhance team communication

This Presentation is:

An attempt at being

enough to get you started
when you get back to work

This Presentation will:

Demystify CI

A Play in Three Acts

1. What Life's like with Jenkins

2. How to set it all up

3. Q & A

With Three Players

1. Jenkins Continuous Integration Server (f/k/a Hudson)

2. ANT (Another neat tool)

3. MXUnit

What is Continuous Integration?

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What is CI for a dynamic language application?

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Ideally: Always testing your app

- Unit tests
- Integration tests (Selenium, eg)

What is CI for a dynamic language application that can only run in a webserver?

At a minimum: Always packaging your app for deployment

Ideally: Always testing your app

- Unit tests
- Integration tests (selenium, eg)

Potentially: Always deploying your app

-- This would happen on a schedule
or a trigger (svn commit, eg) --

What is CI for a dynamic language application that can only run in a webserver?

The CI server can even help you do those things in a NON-Continuous manner

Click a button, deploy to Test

Click a button, deploy to Staging

Click a button, build all your deployables (zips, wars, eg)

What is a Continuous Integration Server?

Scheduler

What is a Continuous Integration Server?

Coordinator

What is a Continuous Integration Server?

Notifier

What is a Continuous Integration Server?

Artifact Aggregator

What is a Continuous Integration Server?

Reporter

Trends / Application Health

What is a Continuous Integration Server?

Auditor

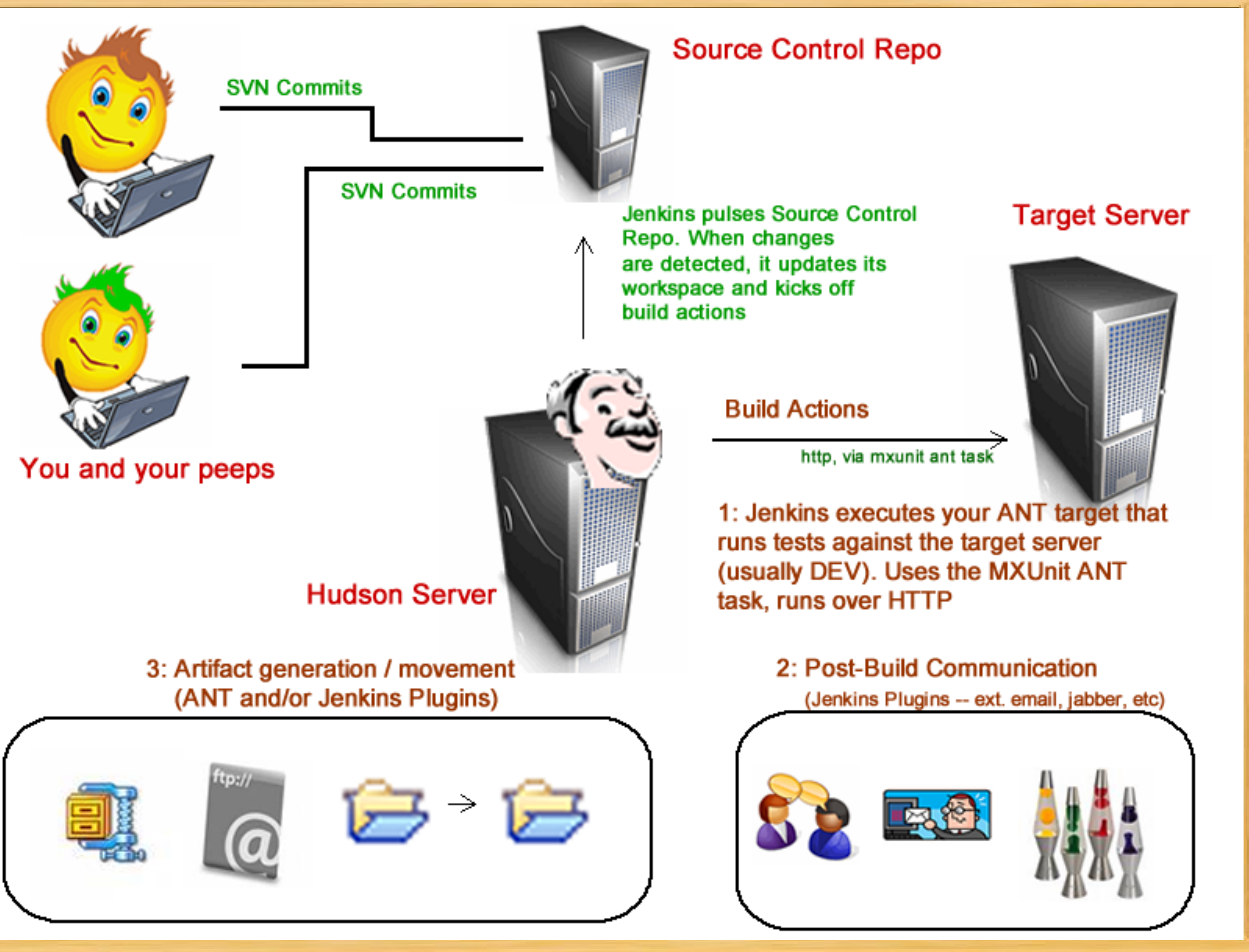
Know This

You cannot answer

"What's broken?"

Know This

...Without Tests



Source Control Repo

SVN Commits

SVN Commits

Jenkins pulses Source Control Repo. When changes are detected, it updates its workspace and kicks off build actions

Target Server

You and your peeps

Build Actions

http, via mxunit ant task

1: Jenkins executes your ANT target that runs tests against the target server (usually DEV). Uses the MXUnit ANT task, runs over HTTP

Hudson Server

3: Artifact generation / movement (ANT and/or Jenkins Plugins)

2: Post-Build Communication (Jenkins Plugins -- ext. email, jabber, etc)

Demo Time!

Your Life, with CI

3 Things You NEED to know

1. You will get the most out of CI
   if you have tests

In other words, the usefulness of CI increases dramatically as your testing habits improve

3 Things You NEED to know

2. Resources can seem scarce*

Not as easy to find answers as, say, searching for "CFWindow"

* See the end of this deck for a list of good resources

3 Things You NEED to know

3. You can't avoid ANT any longer

It's the glue between Jenkins and your tests

If you think:

ANT is too hard
XML sucks
ANT is scary
Ooooh, great, another thing to learn

OOOH, GREAT, another annoying Java thing being pushed on me by some jerkoff who couldn't make it programming in a real language so he learned CF in 3 days and now he wants to seem like a bigshot so he's all like "Yeah, ANT rocks, you need to learn it or you should quit programming and go work at Wal-Mart because you're too stupid to be in front of a computer and speaking of which who the hell even let you have a keyboard in the first place

Stop your fretting!

- CFPARAM <-- very important!
- CFFUNCTION
- CFINCLUDE
- CFFILE
- CFHTTP
- CFDIRECTORY
- CFOUTPUT
- CFDUMP
- CFZIP
- #variable#

Stop your fretting!

CFPARAM	<property />
CFFUNCTION	<target />
CFINCLUDE	<import/> & <taskdef />
CFFILE	<copy /> <delete />, etc
CFHTTP	<mxunit.../>
CFDIRECTORY	<mkdir />
CFOUTPUT	<echo />
CFDUMP	<echoproperties />
CFZIP	<zip />
#variable#	${property}

Stop your fretting!

MXUnit ships with a sample ANT build file that does almost all of the work for you!

It's built to be Jenkins-friendly

/mxunit/samples/build.xml

Part II: How to Set it all Up

1. Install a JDK

download, install, note where you installed it, and forget about it

*As of now, it's at http://www.oracle.com/technetwork/java/javase/downloads/index.html
Simply get the JDK... no need for "bundles" (JavaEE, Netbeans, etc)

Part II: How to Set it all Up

2. Install ANT

download, unzip somewhere, note where you unzipped it, and forget about it

* http://ant.apache.org/bindownload.cgi

Part II: How to Set it all Up

3. Download Jenkins

It's a single .war file; put it somewhere sensible

(I keep a directory named "appservers", with Railo, OBD, Tomcat, etc. I keep the jenkins.war file in there.)

* http://jenkins-ci.org/

Part II: How to Set it all Up

You do NOT need to install Tomcat

You can install Jenkins as its own container easily, from within Jenkins itself

Demo Time!

Running Jenkins

```
cmd> cd c:\dev\appservers\jenkins
cmd> java -jar jenkins.war
```

(yes, that's it)

Demo Time!

Configuring Projects

Configuration steps

ANT/MXUnit

1. Copy /mxunit/samples/HttpAntRunner.cfc into your test directory
2. Copy /mxunit/ant/lib/mxunit-ant.jar into a /yourapp/lib/
3. Copy /mxunit/samples/build.xml into your application's root
4. Change the application.name property to the directory name of your application
5. Change any other properties as necessary
6. Run the runtests target to confirm ant is running your tests correctly
7. Commit everything to svn

Jenkins

1. Add a new Job
2. Give it the Source Control URL for your project. Run a build to confirm it checked out the code
3. Set up the scheduling (build triggers)
4. Add a build step to run your "runtests" ANT target. Run a build to confirm it ran your tests
5. Add build steps for "dist" and potentially for "svn.update" (move "svn.update" to the top)
6. Archive the artifacts. They'll be in <projectname>/deploy/*.zip
7. Publish JUnit test result report. They'll be in <projectname>/test/testresults/xml/*.xml
8. Configure email notifications. Configure jabber (IM) notifications if you want
9. Explore available plugins and have fun with CI!

Question:	Answer, with CI:
When that code gets to your dev server, when are your tests run?	Whenever you want them to
When your tests get run, what happens when something errors or fails?	Emails, IMs, Chats... can be targeted to "culprits", as well
Do you have metrics on how your tests are improving over time?	Yes, no extra work required
Is it easy for any team member to *see* the status of the build (i.e. the number of failing/passing tests)?	Yes. Access control is possible as well
When the tests are run and everything is OK, is the entire project available for deployment (a zip file, for example)?	Yes, zip via ANT and artifacts are easily archived
When someone checks in code to source control, how does that code get to your dev server?	If you don't have that solved, CI can help

Where to learn more about Jenkins and CF

-- MXUnit Wiki:

http://wiki.mxunit.org/display/default/Automation+with+Jenkins+Continuous+Integration+Server

-- When you get stuck, join the MXUnit Google group and ask questions

http://groups.google.com/group/mxunit

-- Jenkins wiki:

http://wiki.jenkins-ci.org/display/JENKINS/Home

-- Jenkins Book (open source, free, work in progress)

http://www.wakaleo.com/books/continuous-integration-with-hudson-the-book

Where to learn more about ANT and CF

-- Jim Priest's recorded presentation on UGTV:

http://experts.acrobat.com/p53858056/

-- Go to http://carehart.org/ugtv and search for "ANT"

-- Jim Priest's ANT wiki

http://www.thecrumb.com/wiki/ant

-- My materials from 2008 CFUnited preso on ANT (contains a LOT of example build files)

http://mxunit.s3.amazonaws.com/doc/zip/CFU2008ANT.zip

Thanks!

Marc Esher

@marcesher on Twitter

http://www.mxunit.org

Test

Be Happy

Credits

All CFML generated using Terry Ryan's Apptacular ColdFusion Builder extension

All cheesy icons from office.microsoft.com. Don't hate.

Except the Hindu god, he did not come from MS.