

Agile + DevOps **WEST**

A TECHWELL EVENT

AD10

Agile Testing & Test Automation

11:45 AM

AD10 - Hunting Sasquatch: Finding Intermittent Issues Using Periodic Automation

Presented by:

Paul Grizzaffi

Magenic

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Paul Grizzaffi

As a Principal Automation Architect at Magenic, Paul Grizzaffi is following his passion of providing technology solutions to testing and QA organizations, including automation assessments, implementations, and through activities benefiting the broader testing community. An accomplished keynote speaker and writer, Paul has spoken at both local and national conferences and meetings. He is an advisor to Software Test Professionals and STPCon, as well as a member of the Industry Advisory Board of the Advanced Research Center for Software Testing and Quality Assurance (STQA) at UT Dallas where he is a frequent guest lecturer. Paul enjoys sharing his experiences and learning from other testing professionals; his mostly cogent thoughts can be read on his blog.

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I'm Hunting Sasquatch



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Who Is This Guy?

- » Paul Grizzaffi
- » Principal Automation Architect at Magenic
- » Career focused on automation
- » “Software Pediatrician”
- » Advisor
 - › STPCon
 - › Advanced Research Center for STQA at UT Dallas







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Where Is This Guy?

-  paulg@magenic.com
-  <http://www.linkedin.com/in/paulgrizzaffi>
-  @pgrizzaffi
-  <http://responsibleautomation.wordpress.com>



What's a Sasquatch?



What's a Sasquatch?

- » "...name given to an ape-like creature that some people believe inhabits forests, mainly in the Pacific Northwest region of North America", per Wikipedia
- » An issue that never happens when you are looking for it
- » An issue that the developers don't believe exists
- » (We'll not be discussing the first bullet today)



Integration Hell



Integration Hell

- » Developers A and B write features in separate branches
- » Common code is modified – more divergent over time
- » Lots of time spent merging code
- » Then testing begins...Issues!
 - › Merge issues
 - › Functional issues
 - › Resolve issues
 - › Lather, rinse, repeat
- » Imagine 10 developers on 5 branches!
- » Make “Sweet Mother of Merge” release



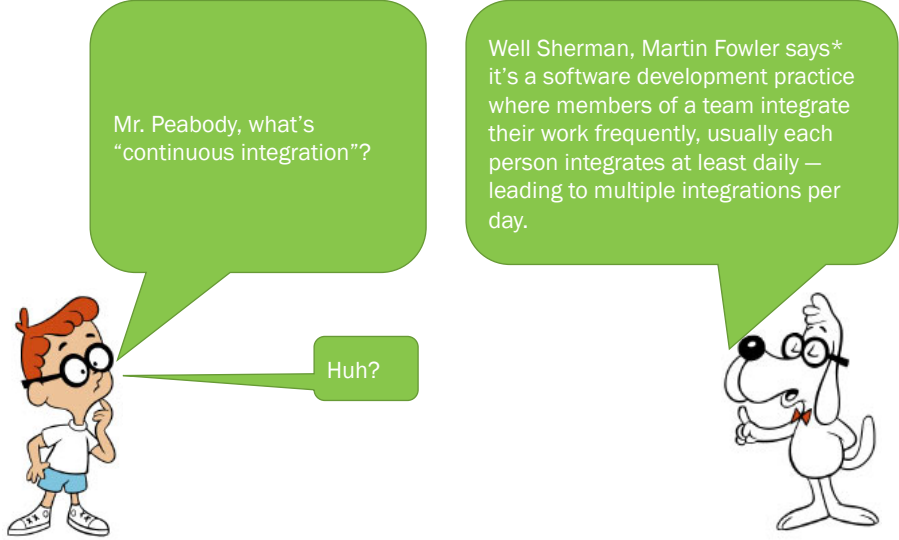
Salvation?



Salvation?

- » What if we merge and integrate earlier?
- » Break the problem into smaller chunks
 - › Then we could test earlier
 - › And find defects earlier
 - › **Can** require less effort to resolve
- » ~~Vote~~ “Integrate early and often”
- » “Continuous integration”





Mr. Peabody, what's "continuous integration"?

Huh?

Well Sherman, Martin Fowler says* it's a software development practice where members of a team integrate their work frequently, usually each person integrates at least daily – leading to multiple integrations per day.

* <http://martinfowler.com/articles/continuousIntegration.html>

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Basic Continuous Integration Steps



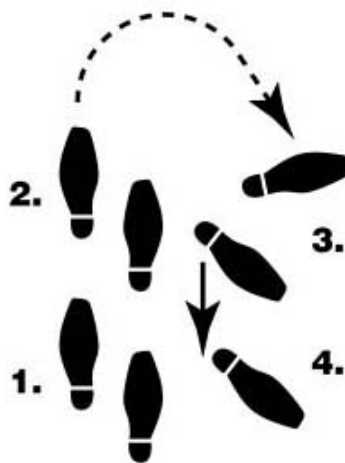
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Basic Continuous Integration Steps

- » Developer checks in code
- » Automated compile/build
- » Automated unit checks
- » Alert on any failure
- » Some issues found sooner, easier to address

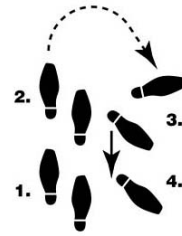


Adding Steps

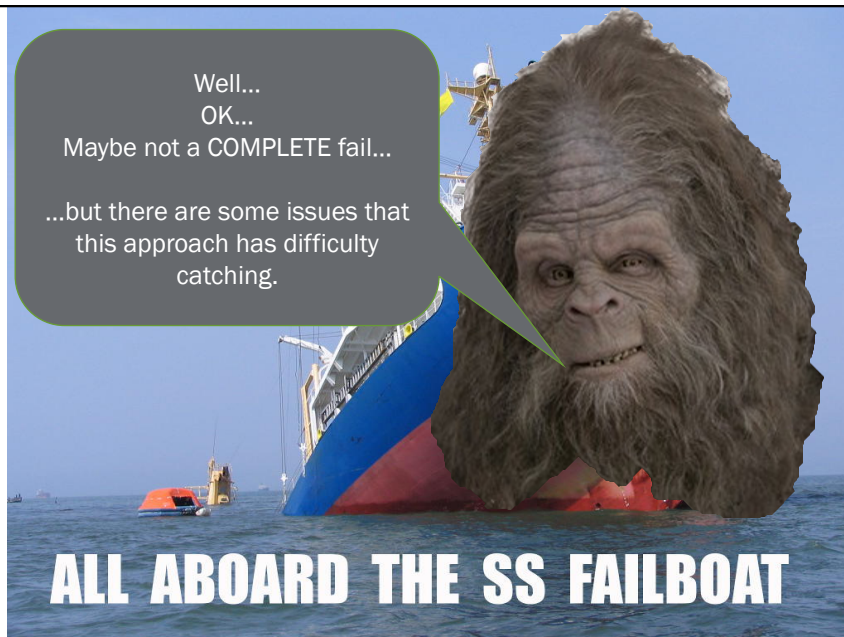


Adding Steps

- » As we mature
 - › Automated deploy, provision, etc.
 - › Automated checks (Continuous Testing)
 - › Alert on any failure
- » More issues found sooner, easier to address



Success!!!
T-Shirts For Everyone, Right?



What Am I Worried About?

What, Me Worry?

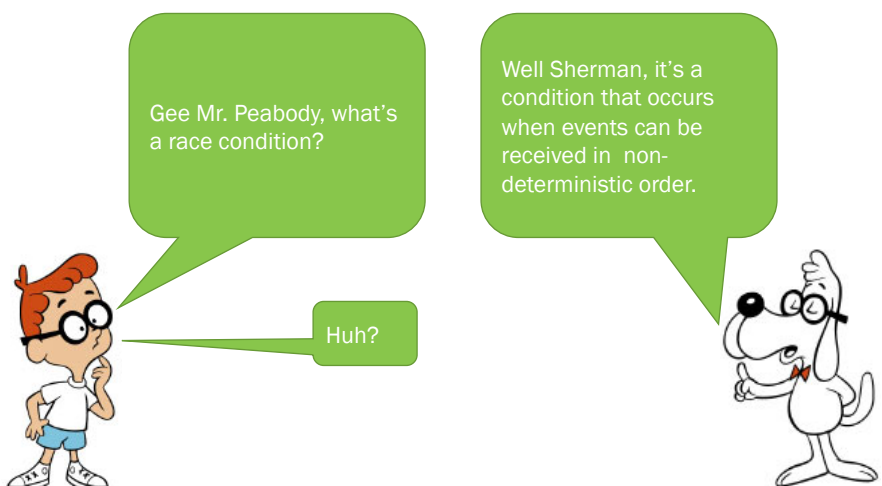


What Am I Worried About?

- » Configuration changes
 - › Network-related
 - › Tool
 - › System Under Test (SUT) related
- » Intermittent issues
 - › Periodic maintenance activities
 - › Quirky test environments
 - › Race conditions

What, Me Worry?





Gee Mr. Peabody, what's a race condition?

Huh?

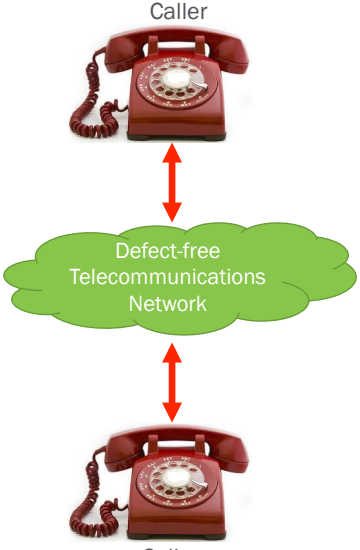
Well Sherman, it's a condition that occurs when events can be received in non-deterministic order.

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What's A Race Condition?



Caller

Defect-free Telecommunications Network

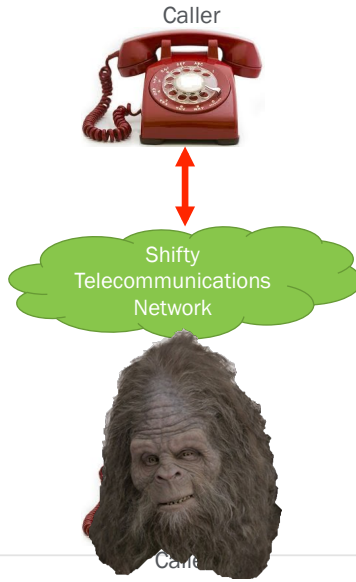
Callee

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What's A Race Condition?

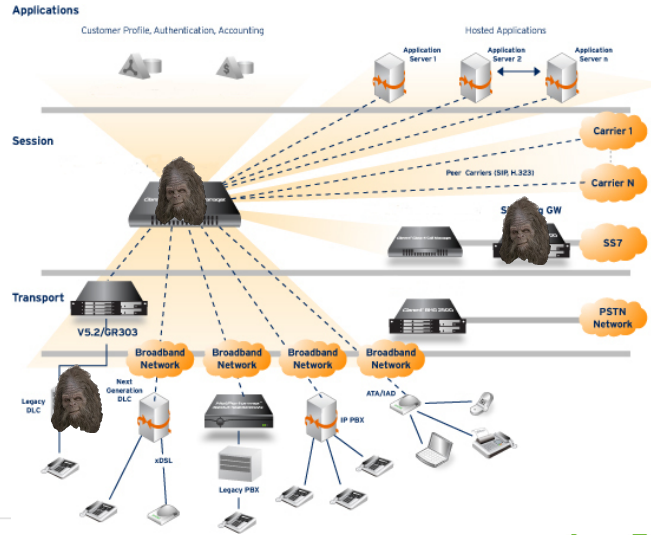


Wait A Minute...

Wouldn't you have found me during your functional or feature testing?



What About In This System?

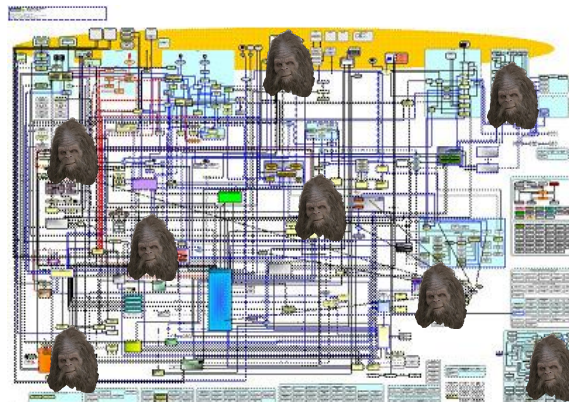


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What About In *THIS* System?

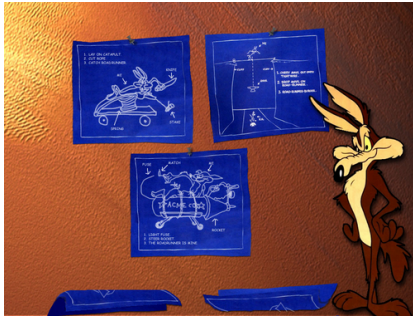


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Why Is This So Difficult?



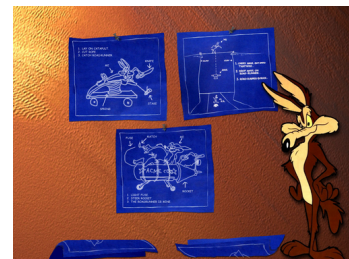
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Why Is This So Difficult?

- » Humans are flawed creatures
- » High number of combinations and permutations
- » 3rd party interaction can be unpredictable
- » Enumerating is tedious and error prone
- » Limitations of available people and resources



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In Our Sights...



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In Our Sights...

- » Keep running the “on every deploy” scripts
- » “Periodic Automation”
- » Periodically rerun the scripts
- » Increases chance of seeing the elusive beast
- » Investigate every sighting
- » Development/Test partnership initiative



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An Actual Sighting!

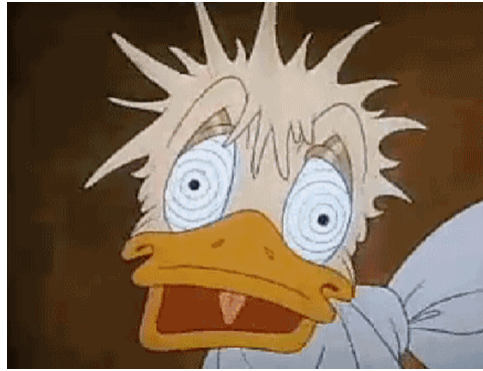


An Actual Sighting!

- » Issue: return to login screen during purchase
- » Dev says: It's fixed now, I can't reproduce it
- » Periodic automation reproduces
- » It must be an automation problem
- » Gnashing of teeth and rending of cloth
- » Surprise! Unhandled race condition!
- » Periodic automation helped

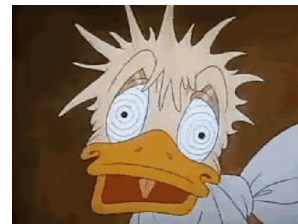


Beware Failure Fatigue

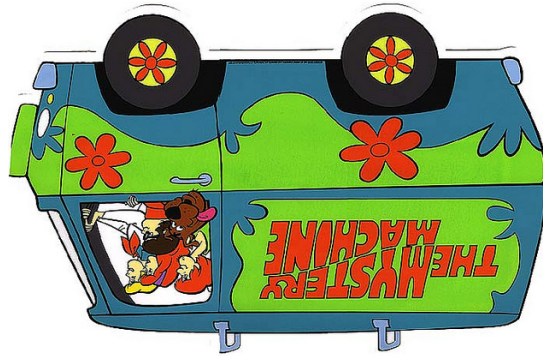


Beware Failure Fatigue

- » It's "extra work"
- » Triage effort
 - › ALL results need to be reviewed
 - › Focus on failures, don't ignore successes
 - › Time is of the essence
- » Trust issues
 - › "We only see this with automation"
 - › "Did you reproduce this manually?"
 - › "Oh, that scenario fails sometimes, just ignore it"
 - › "Pushing the van back up the hill"



Amusing Anecdote



Desensitization



Desensitization

- » Are trust issues THAT bad?
- » Yes, they are
- » Less likely to
 - › Review the all results
 - › Investigate or report failures
 - › Actually find these issues



Keep Up Your Strength

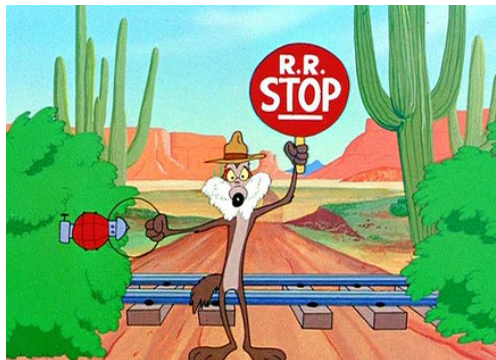


Keep Up Your Strength

- » Keep noise to a minimum
 - › Only alert “usual suspects”
 - › Reports non-abrasive but prominent
 - › Better error/log messages
- » Fix it
 - › Fix the tool
 - › Fix the scripts
 - › Fix the product
- » Only check what will be fixed

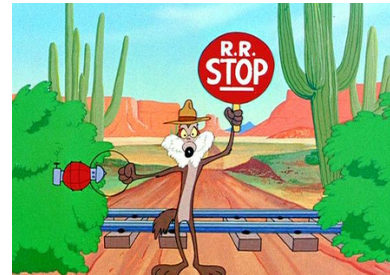


Stop Testing?!?!



Stop Testing?!?!

- » Fixing issues requires effort
- » Testing fixes requires effort
- » Business may not want a fix
- » This can lead to...
 - › Constant or intermittent failures
 - › Which leads to more triage effort
 - › Which leads to more failure fatigue



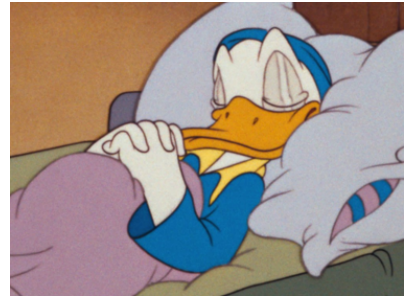
A Little R&R



A Little R&R

- » Stop that script (that certainly stops the failure)
- » If it will be fixed eventually...
 - › Change script to check for the incorrect behavior
 - › Add script change activity to defect's work item
 - › And make it fail when correct behavior is restored

← Heresy!



Confession

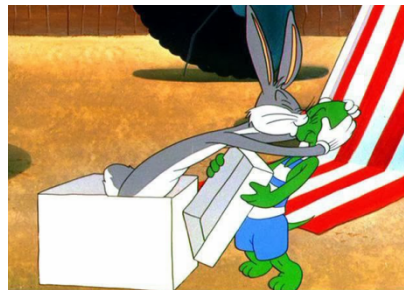


Confession

- » I sort of backed into this
- » I'm lazy (the good kind)
- » Needed a CI/CD-like environment
- » BAT file to run scripts every 30 minutes
- » Noticed it was good at finding Sasquatch

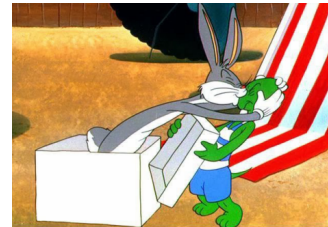


About That Partnership



About That Partnership

- » Wanted a highly visible state of the product
- » Had home automation stuff laying around
- » “Red Light Suite”
- » “Why’s the red light’s on?” – A Tester
- » Time passes, Sasquatch eliminated
- » “Why’s the red light’s on?” – A Developer



HiVAT



HiVAT

- » High Volume Automated Testing
- » The actual inspiration
- » “...a family of testing techniques that enable the tester to create, run and evaluate the results of arbitrarily many tests” *
- » “...hunting hard-to-replicate bugs that involve timing...” **
- » Dr. Cem Kaner ***
- » Inspiring area: exploit existing tests or tools



* <http://context-driven-testing.com/?p=69>
 ** <http://kaner.com/pdfs/StarHiVAT2013KanerOliverFioravantiFinal.pdf>
 *** <http://kaner.com/?p=278>

Areas of HiVAT *

- » Tests focused on inputs, including
 - › High-volume combination testing
 - › Fuzzing
- » Tests that exploit the available oracles, including
 - › Functional equivalence testing
 - › Constraint checks
- » Tests that exploit existing tests or tools, including
 - › Long-sequence regression testing
 - › Load-enhanced functional testing



* <http://kaner.com/?p=278>

Outside Of Continuous Integration



Outside Of Continuous Integration

- » Also of note regarding HiVAT
 - › Random
 - › Human investigation of results
- » “Scud”
- » Two implementations
 - › eComm – Randomly clicks web page links
 - › Healthcare – Randomly clicks menu items
- » Reports on things that “don’t seem right”
- » Testers audit results
- » Does not lend itself to traditional “pass/fail”







Takeaways

- » Some issues are intermittent...they just are
- » Keep “run on deploy”, add periodic automation
- » You must trust your automation (the truth is out there)
- » Look at results – fail and pass
- » Beware failure fatigue



Questions!

-  paulg@magenic.com
-  <http://www.linkedin.com/in/paulgrizzaffi>
-  @pgrizzaffi
-  <http://responsibleautomation.wordpress.com>

