DevOps – Driving Quality Through Risk Mitigation

Dr. David Votaw
Automation Wizard
NGC
Who is David Votaw?

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- **Background**
  - Software Developer - 14 years
  - Doctorate of Computer Science (DCS) in Information Assurance
    - Dissertation: Improving risk mitigation throughout the software development lifecycle.
    - DevOps was my main driver for research

- **Current Assignments**
  - Taking teams to the next level of DevOps
  - Research and innovation

- **Fun**
  - Family
  - Video games
  - Road trips
  - Heavy metal \m/
Who is David Votaw? Cont.

Bryce Canyon, Utah - 2019

Zion, Utah - 2019
Who is David Votaw? Cont.

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Amon Amarth
Agenda

• This presentation will provide a summary for automation and testing through DevOps:
  • Culture and atmosphere to support DevOps
  • Test Driven Development (TDD)
  • Manual acceptance testing
  • Automated regression testing
  • Process automation
  • Pipeline automation
Culture and atmosphere to support DevOps
Culture and atmosphere to support DevOps  Cont.

• Level setter- if you are not a mature agile team currently, then DevOps is not a good fit for you at this time.
  – There is no cheat code to get to level 100, you must continue to level up and improve your stats!
  – DevOps is not for Falsely Reporting Agile or “Fragile” teams.
  – “DevOps is hard, and most will fail.”- David Votaw

• Common understanding and goal from all stakeholders.
  – If all stakeholders are trained for agile and understand the DevOps journey, then there will be a common understanding of expectations and tone for the solution.

• Resources: Time, money, and people are necessary.
  – Dedicated resources, and not one who wears many hats.
  – Teams need to continually learn, innovate, and try new things.
Test Driven Development (TDD)

I'm a Programar
Programar
Programer
I write code.

TDD
ALL CODE IS GUILTY UNTIL PROVEN INNOCENT
Test Driven Development (TDD) Cont.

- Yes, lots more code to test a small code block!
  - Sometimes 10x more code than without a test per method
  - Write a unit test before the actual coded method.

- It will fail, and that is ok, now fix it!
Test Driven Development (TDD) Cont.

• Provide some actual content in the method and test method to copy a file from point a to point b.

```csharp
public class Program
{
    public static void Main(string[] args)
    {
        Console.WriteLine("Hello World!");
        // Arrange
        string currentDirectory = Environment.CurrentDirectory;
        string source = currentDirectory + \"\file1.txt\";
        string destination = currentDirectory + \"\file2.txt\";
        File.Copy(source, destination);
    }
}
```

• Hey look at that, it passes!

• But what happens if we run the same test again??
Test Driven Development (TDD) Cont.

Why did it fail? The first run was successful, but all subsequent runs fail, why is that?

Things to think about:
- What if file1 doesn’t exist?
- What if file2 does exist?
- What if neither exist?
- What if access is denied?
- What if there is a network error?
- What if “insert statement here”, etc…
Manual acceptance testing

Manual Testing

VS

Automated Testing
Manual acceptance testing  Cont.

• Somebody has to do the work manually to clearly define the manual process for testing.
• You cannot automate manual testing of an immature or non-repeatable process, but rather, it takes time and effort to make a mature and repeatable process.

The manual test cases must be well-defined and understood before any automation can occur.
Automated regression testing
Automated regression testing Cont.

You want the same level of rigor and repeatability through regression testing, just as you do with unit level testing.

These majority of tests are not a one and done, but rather these tests will be tweaked and maintained each iteration!
Process automation
Process automation traditionally starts with a Continuous Integration (CI) build

- Code change
- Check-in
- Unit testing
- Static Code Analysis (SCA)
- Compiled output

- Copy artifacts
- Run scripts
- Configuration
- Deployments

- Acceptance testing
- User testing
- Integration testing
- Bug reports

These three related but separate processes can become one with pipeline automation
Pipeline automation
Pipeline automation Cont.

• Every vendor is going to try and sell you a solution that tries to do it all
• Are you **Developer** or **Operations** heavy?
• Tools are tailored for both sides of the equation, and depending where you fall on that scale should warrant tool research.
Questions??
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- Bad code - https://www.redbubble.com/shop/bad-code-stickers
- Clickers - https://thelastofus.fandom.com/wiki/The_Infected
- Continuous Integration - https://www.silverstripe.org/blog/developers-how-we-use-continuous-integration-at-silverstripe/
- Copy/Paste - https://www.pinterest.com/pin/559290847446797840/
- Culture - https://www.tdtktalks.com/workplace-culture-grows-personal-culture/
- Digital automation - https://vuesol.com/digital
- Easy button - https://www.bostonglobe.com/business/2014/01/03/staples-introduces-new-make-more-happen-slogan/b7Df4W0idC1VjERXnESCJ/story.html
- Learn new things - https://www.lifestyleupdated.com/2012/05/11/learning-something-new-7-benefits/
- Pipeline - https://www.rockwellautomation.com/site-selection.html
- Pipeline automation - https://insights.sei.cmu.edu/devops/2017/06/microcosm-a-secure-devops-pipeline-as-code.html
- Road Trip - https://quirkcars.com/hidden-secrets-save-road-trip/
- Scaled DevOps - https://www.thinkahead.com/expertise/scaled-devops/
- Selenium - https://www.seleniumhq.org/
- TDD Basics - https://android.jlelse.eu/basics-of-unit-testing-affdd2273310
- Telerik - https://www.toolsqa.com/telerik