Xamarin Evolve 2014

Software that Builds Software

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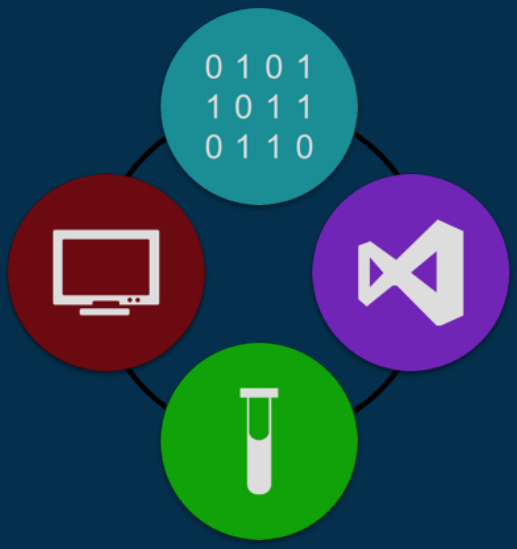
Continuous Integration Overview

- What is Continuous Integration (CI)?
- What Does it Do For Me?
- What Do I Need for CI?
- Setup
- Xamarin Test Cloud
- Guidance



Demo

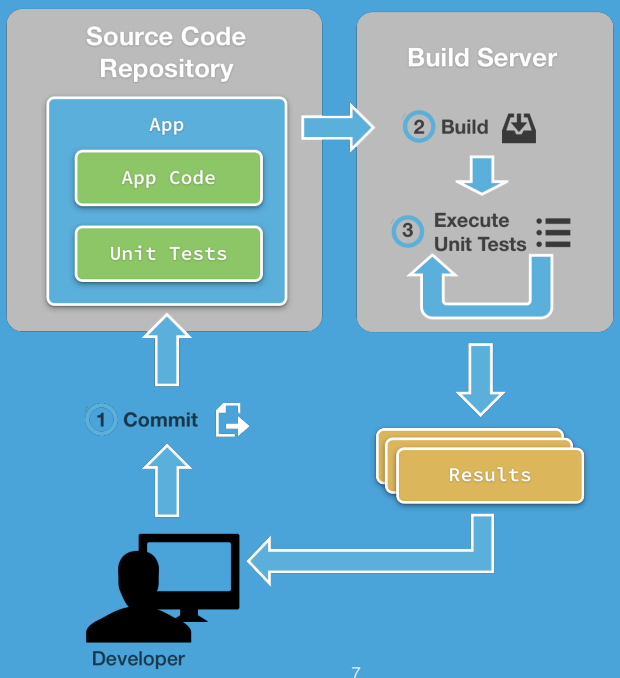
What Is Continuous Integration?

What Is Continuous Integration?

"Continuous Integration (CI) is a development practice that requires developers to integrate code into a shared repository several times a day. Each check-in is then verified by an automated build, allowing teams to detect problems early. "

Textbook Definition from ThoughtWorks

The Continuous Integration Workflow



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What will CI do for me?

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"Continuous Integration doesn't get rid of bugs, but it does make them dramatically easier to find and remove."

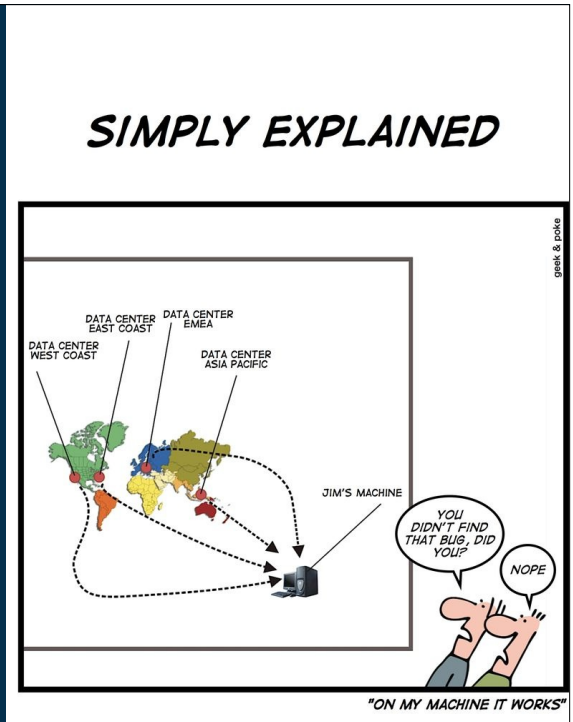
Martin Fowler
Chief Scientist, ThoughtWorks

Minimizes the "Merge Migraine"

- Frequent integration results in smaller commits
- Easier to rollback small commits

Find Problems Quicker

- Detect errors close to the source
- Cheaper and easier to fix

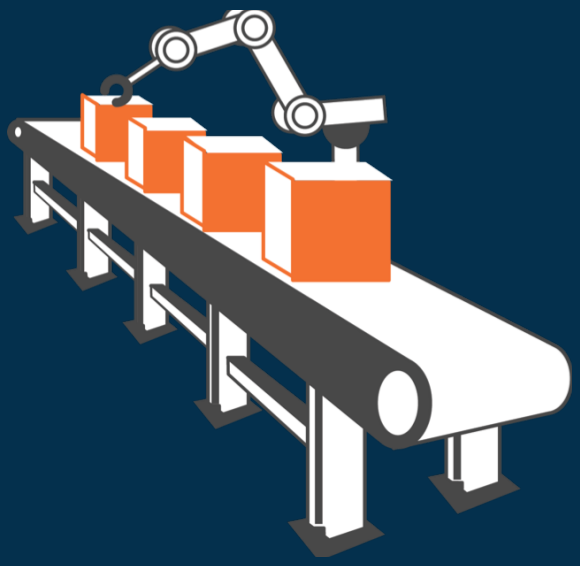


No more "Works on my Machine!"

- Consistent, repeatable builds
- App will work everywhere
- Less chance of *build contamination*

Deployable Software Any Time

- "We need to show this to a customer NOW!"
- Get bug fixes out quicker
- Release new features easier
- Confidence in the Software



What Do I Need for CI?

Source Code Management

Team Foundation Server
or
Visual Studio Online

Git / Github

Subversion

CI Server Software

Jenkins

- Open Source
- Windows & OS X
- Easy to setup
- Lots of plug-ins

CI Server Software

TeamCity

- Free Edition & Commercial Licenses
- Windows & OS X
- Easy to Install
- Scales Out
- Lots of Plugins

CI Server Software

TFS

- Not Just CI
- Windows Only - Still Requires A Mac Build Host
- Requires Xamarin Pro or Business

Setup

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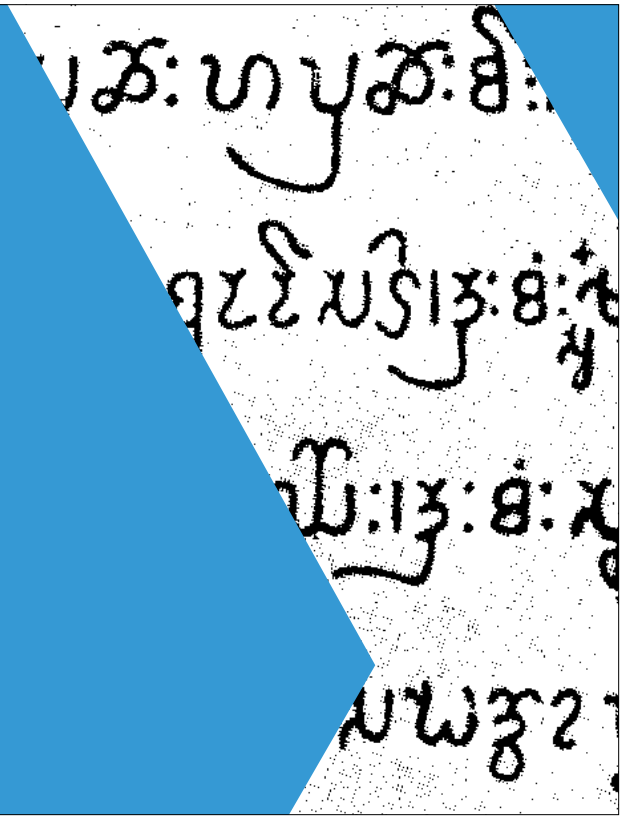
Setup Checklist

- Get Source Code Server
- Get CI Server Up & Running
  - Dedicated Computer
- Install & Activate Xamarin Studio
  - Authenticate with Component Store
- Write Build Script
- Configure Job or Build in CI Server

By Ragesoss via Wikimedia Commons

Why Script the Build?

- Documentation
- Traceability
- Developers can use it too!
- Easier to Debug and Maintain
- Simplifies Setting up the CI Server



Build Scripts

Option #1: Rake

- A DSL for Builds
- Lots of Gems to support builds
- Works on both Windows & Mac

Sample: A Rakefile

```
desc "Compiles the Android and iOS projects."
task :build => [:clean, :build_android, :build_ios] do

end

desc “Builds a Debug and Release IPA.”
task :build_ios do
  puts "Build the IPA:"
  system("#{@mdtool} \"--configuration:Debug|iPhone\" TaskyPro-Calabash.sln")
  system("#{@mdtool} \"--configuration:Release|iPhone\" TaskyPro-Calabash.sln")
end

desc "Build a Release APK."
task :build_android do
  system("#{@xbuild} /verbosity:diagnostic /t:SignAndroidPackage /
p:Configuration=Release ./Tasky.Droid/Tasky.Droid.csproj")
end
```


Build Scripts

Option #2: Powershell (psake)

- A DSL written in Powershell for Builds
- Great for Windows
- Not as many plugins (gems) as Rake

Sample: PSake

```
task default –depends Test

task Test –depends Compile, Clean {
  $testMessage
}

task Compile –depends Clean {
  $compileMessage
}

task Clean {
  $cleanMessage
}
```


Build Scripts

Option #3: FAKE - the F# make

- A DSL for Builds
- Works on Windows & Mac
- Very Rake-like

Sample: FAKE

```
#r "tools/FAKE/tools/FakeLib.dll" // include Fake lib

open Fake

Target "Test" (fun _ ->
    trace "Testing stuff..."
)

Target "Deploy" (fun _ ->
    trace "Heavy deploy action"
)

"Test"            // define the dependencies
   ==> "Deploy"

Run "Deploy"
```

Xamarin Test Cloud

Setting Up Test Cloud

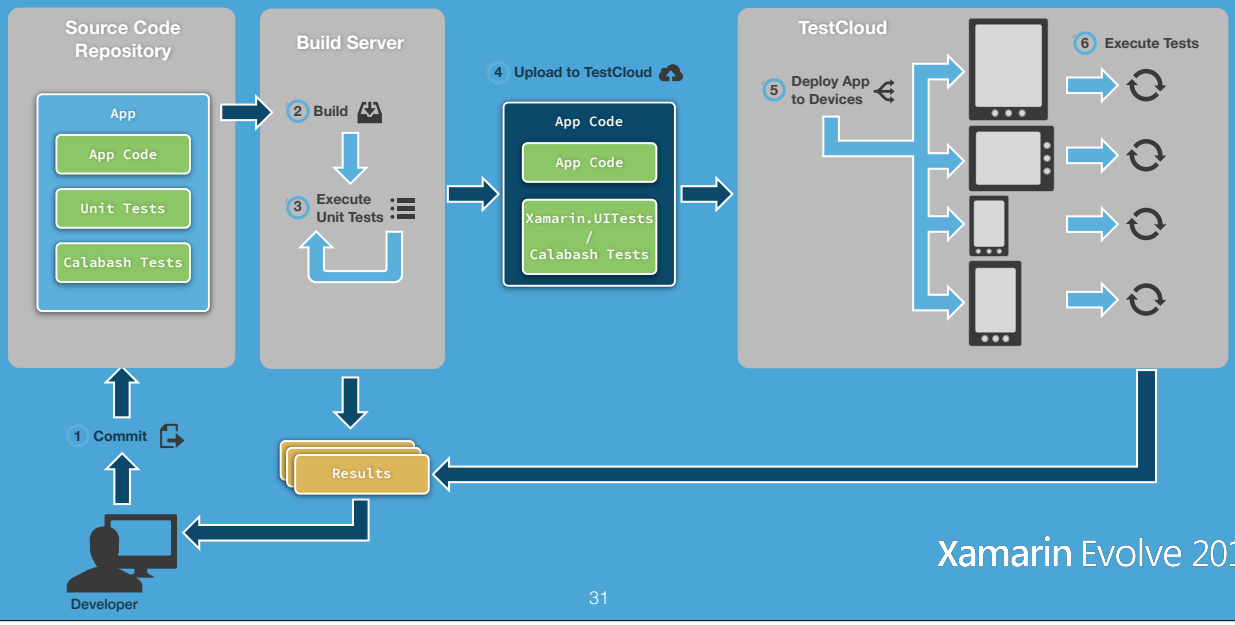
- Get a Test Cloud API key
- Create a Test Run to get the Device ID's for iOS & Android
- Install Calabash or Xamarin.UITest
- Install Calabash Component (for iOS)
- Update the Build Script

Sample Rake Task for Xamarin Test Cloud

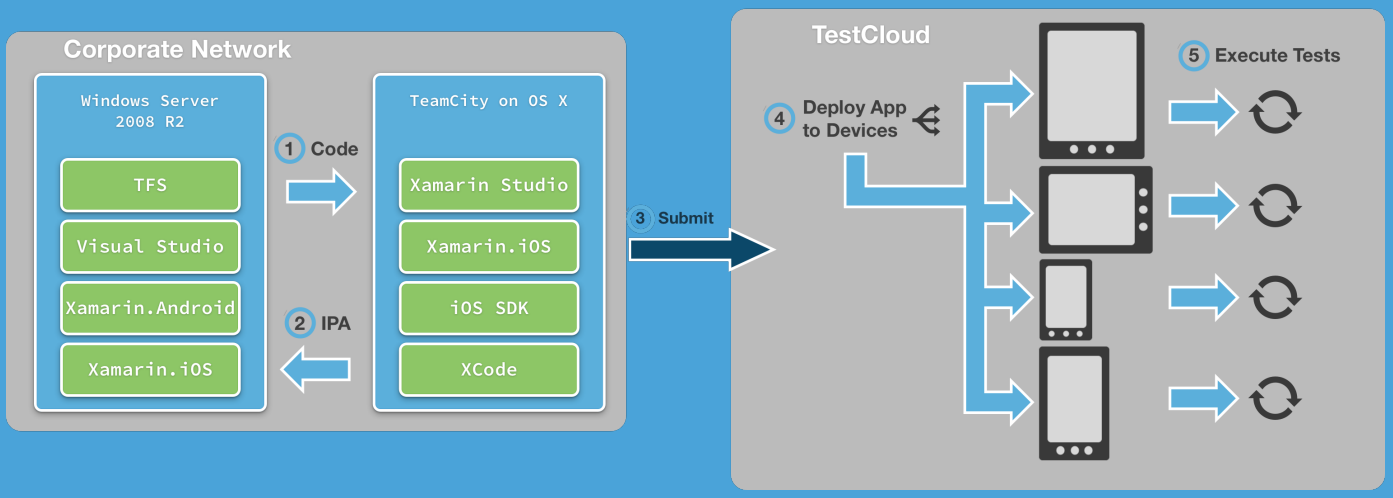
```
desc "Submits the IPA to Test Cloud."
task :xtc_submit_ios => [:require_environment] do
  raise "Missing the IPA #{@ipa}." unless File.exists?(@ipa)
  tests_passed = system("test-cloud submit #{@ipa} #{@testcloud_api_key}
                         -y #{@dsym} --devices=#{@ios_device_id}
                         --config=config/cucumber.yml --profile=ios
                         --pretty  --app-name=\"Tasky Pro\"")
  raise "Some tests failed in test cloud - check the build log. #{$?}" unless
tests_passed
end
```

New and Improved CI WorkFlow

Now With More Xamarin Test Cloud!



Team Foundation Server / TeamCity



Demo 2

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Advice From the Trenches

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CI Commandments

Thou Shalt:

- Automate
- Commit *Early*, Commit *Often*
- Build *Fast* - Fail *Fast*
- *Never* Commit *Broken* Code
- Fix Build Failures *Immediately*
- Build in *every* target environment

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Go Forth And Integrate Continuously

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