

# Introduction to Hands-on-Labs for building out a Continuous Delivery Release pipeline with Team Foundation Server

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## Objectives

This series of labs teaches you how to implement a continuous delivery release pipeline by using Team Foundation Server 2012. You begin by building a simple release pipeline that supports continuous integration, but has no other automation. Subsequent labs modify and extend the pipeline until it supports continuous delivery and includes features such as automated deployments and automated testing.

A good starting point is reading the book that the labs are based from patterns & practices guide [\*Building a Release Pipeline with Team Foundation Server 2012\*](#), available online. This guidance emphasizes four patterns that are critical to developing a continuous delivery pipeline and whose importance is reinforced by the hands-on labs (HOL). The patterns are:

- Orchestration
- Automation
- Monitoring
- Measuring

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Even as new technologies become available, the underlying patterns that shape your development efforts will remain the same.

This document is an introduction to the labs and discusses the following topics:

- Contents of the HOLs.
  - Prerequisites for the HOLs.
  - Where to find more information about the prerequisites.
  - ALM Rangers Material
  - Standard IIS Configurations.
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## Contents of the HOLs

There are six labs themes in this series although most of them are actually collections of sub-labs underneath them.

One the biggest challenges in learning about distributed architectures such as the ones required in building out Release Pipeline architecture is dealing with infrastructure issues. The details in setting up and tearing down infrastructures becomes a serious time impediment in learning. To help you get to cover the core learnings the overall lab is organized with 2 levels. Starting with Lab 1 you work core TreyResearch.SLN which will works on a [Brian Keller VM](#) so there is minimum infrastructure to deal with and you can focus on the learning. In Lab 6, there exist an advance part that extends the learning of the Release Pipeline to work with Windows Phone 8 and WCF Azure Service.

- **Lab 1: Creating the Trey Research Environment.** In this lab you install the Trey Research application and create the initial version of the Trey Research release pipeline.
- **Lab 2: Orchestrating the Trey Research Pipeline.** This is a series contains 4 sub-labs. In the first sub-lab you orchestrate the commit stage of the pipeline. In the second sub-lab you orchestrate the rest of the pipeline stages. In the third sub-lab you configure the pipeline. In the fourth sub-lab you test the orchestration.
- **Lab 3: Automating the Trey Research Pipeline.** This is a series contains 4 sub-labs. In the first sub-lab you automate the deployment of the WCF service. In the second sub-lab you automate the deployment of the WPF application. In the third sub-lab you automate the tests. At the conclusion of this sub-lab you have created a continuous delivery pipeline.
- **Lab 4: Monitoring and Measuring the Trey Research Pipeline.** This is a set of 2 sub-labs. In the first sub-lab you learn how to monitor a continuous delivery pipeline. In the second sub-lab you learn how to create custom reports in Microsoft Team Foundation Server (TFS) to track some of the key metrics used with continuous delivery projects.
- **Lab 5: Extending the Trey Research Pipeline.** In this lab you learn how to add new stages to the pipeline.

There are completed-lab sections for the various labs. Allowing you to see a final solution. Ensuring you don't get lost.

## Lab Course Map – how to walk through them

There are 2 ways to work through the labs as mentioned above. The following lays out how to walk through the Core Labs on Brian Keller VM and how to walk through the Advance Labs.

### Core Path – Brian Keller VM

1. Introduction.docx
2. Lab01 – Starting Point
3. Lab2\_1 – Orchestrating the Commit Stage
4. Lab 2\_2 – Orchestrating the Remaining Stages
5. Lab 2\_3 – Configuring the Pipeline
6. Lab 2\_4 – Testing the Orchestration
7. Lab 3\_1 – Automating the Deployment of WCF Service
8. Lab 3\_2 – Automating the Deployment of the WPF app
9. Lab 3\_3 – Running the Automated Tests
10. Lab 4\_1 – Running and Monitoring the Continuous Delivery Pipeline
11. Lab 4\_2 – Metrics for Continuous Delivery in TFS
12. Lab 5 – Evolving the Pipeline by adding new stages

## Brian Keller VM Overview

The VM gives you a strong starting and stable starting point. The virtual machine is fully configured with Team Foundation Server, Visual Studio Ultimate and the necessary software and tools that you need to get running. Without having to give any thought about the supporting infrastructure or spend time installing and configuring the necessary software.

## Check Off List for the HOLs

Here are the items you'll require for the HOL. Note most of them will be on [Brian Keller VM](#). For the Advance lab you'll have to setup a machine to support the various tools. The labs are designed to give you options about the technologies and number of computers that you want to use. For example, you can deploy to a Windows Azure virtual machine (VM) to run an IIS service if you want, but you can run the labs on either a local or remote IIS machine.

To use these HOLs, you should be familiar with the technologies listed here.

## Operating Systems

| Item                   | Brian Keller VM |
|------------------------|-----------------|
| Windows 7              | Yes             |
| Windows Server 2008 R2 | Yes             |
| Windows Server 2012    |                 |
| Windows 8              |                 |

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## Tools

| Item                              | Brian Keller VM |
|-----------------------------------|-----------------|
| Microsoft Visual Studio 2013      | Loaded          |
| Team Foundation Server 2013 (TFS) | Loaded          |
| TFS build controller              | Loaded          |
| Microsoft Test Manager (MTM) 2013 | Loaded          |
| Test controller and agents 2013   | Loaded          |

|                        |        |
|------------------------|--------|
|                        |        |
| Microsoft Office Excel | Loaded |

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## SDKs

|                   |                 |
|-------------------|-----------------|
| Item              | Brian Keller VM |
| Windows Phone SDK | no              |

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## Third-party Libraries

|                      |   |
|----------------------|---|
| Item                 | Brian Keller VM                             |
| TFS Build Extensions | No, but in lab 1 Exercise 6 you install it. |

## Setup Information

This section contains links where you can find more information about the required items listed in the previous section.

## Operating System Links

These links give information about how to develop applications for each operating system.

### Windows 7

The Windows 7 Training Kit for Developers includes presentations, hands-on labs, and demos designed to help you learn how to build applications that are compatible with Windows 7. For more information

see Windows 7 Training Kit for Developers at <http://www.microsoft.com/en-us/download/details.aspx?id=6450>.

## Windows Server 2008 R2

For more information about Windows 2008 R2, see Windows Server 2008 R2 at <http://technet.microsoft.com/en-us/windowsserver/bb310558.aspx>.

## Windows 8

The Windows Dev Center is a great place to start learning about Windows 8. For more information see Dev Center — Windows Store apps at <http://msdn.microsoft.com/en-us/library/windows/apps/br211386.aspx>.

## Windows Server 2012

For more about Windows Server 2012, go to Windows Server 2012 at <http://www.microsoft.com/en-us/server-cloud/ws2012/default.aspx?EP=200072478>.

## Windows Azure

The Windows Azure team has created a great deal of documentation. To sign up for a Windows Azure subscription or a trial, see Windows Azure Purchase Options at <http://www.windowsazure.com/en-us/pricing/purchase-options/>. You will also need to use the Windows Management Portal so that you can configure your Windows Azure service namespaces. For more information about Windows Azure, go to the product website, which has a link to the documentation, at <http://www.windowsazure.com/en-us/>. One tutorial that may interest you is Create a Virtual Machine Running Windows Server at <http://www.windowsazure.com/en-us/develop/net/tutorials/windows-virtual-machine/>.

## Tools Links

The following links give information about the various tools.

### Visual Studio 2013

Visual Studio is the central tool for developing code on the Microsoft platform. For more information, go to the Visual Studio website at <http://www.microsoft.com/visualstudio/eng/products/visual-studio-overview>.

### Team Foundation Server 2013

Team Foundation Server 2013 is the collaboration platform at the center of Microsoft's application lifecycle management solution. For more information, go to the Team Foundation Server website at <http://msdn.microsoft.com/en-us/vstudio/ff637362.aspx>.

### TFS Build Controller

To learn more about how to configure and manage your build controller see Configuring and Managing Your Build System at <http://msdn.microsoft.com/en-us/library/vstudio/ms252495.aspx>.

## Test Controller and Agents

To learn more about test controllers and agents see Setting Up Test Machines to Run Tests or Collect Data at <http://msdn.microsoft.com/en-us/library/dd293551.aspx>.

## Microsoft Test Manager

The MTM does both Lab Management and Test Plan Management. Both capabilities are used during various parts of the HOLs. The MTM works with Team Foundation Server using the build and test controller to configure and control machines forming your Lab Environments used for manual and automated testing. The Lab Management handles the management of creating, modifying and deleting the Lab Environments. The Test Plan Management deals with the Test Plan which organizes the various manual and automated test to be run on the designated lab environment for a selected build. For more information about these tasks, you can refer to the following resources.

- Setting Up Test Controllers in Lab Environments at <http://msdn.microsoft.com/en-us/library/546460.aspx>.
- Getting Started with Lab Management at <http://msdn.microsoft.com/en-us/library/ee943321.aspx>.
- Configuring and Administering Lab Management at <http://msdn.microsoft.com/en-us/library/dd936084.aspx>.
- Creating Lab Environments at <http://msdn.microsoft.com/en-us/library/dd380688.aspx>
- Using a Lab Environment for Your Application Lifecycle at <http://msdn.microsoft.com/en-us/library/dd997438.aspx>.
- ALM Rangers' Visual Studio Lab Management Guide at <http://vsarlabman.codeplex.com/>.

## WiX Tool Set

This lab uses the WiX tool set. WiX allows you to build Windows installation packages from XML source code. WiX supports completely automated installations and uninstallations, and is integrated with Visual Studio and MSBuild. For more information about the Windows Installer, see Windows Installer at [http://msdn.microsoft.com/en-us/library/windows/desktop/cc185688\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/windows/desktop/cc185688(v=vs.85).aspx). For more information about writing WiX files, refer to the WiX tutorial at <http://wix.tramontana.co.hu/> or the WiX manual at <http://wix.sourceforge.net/manual-wix3/main.htm>.

Download it from CodePlex: <http://wix.codeplex.com/releases/view/99514>

## TFS Build Extension

The Team Foundation Server Build Extension is a Ranger project on CodePlex that offer an number of useful workflow activities to construct your pipeline from the build workflow. This is used in Lab 2 to build out the orchestrations. <http://tfsbuildextensions.codeplex.com>



## SDKs

Here's where you can download the SDKs that are required to complete the labs.

### Windows Phone 8 SDK

You can download the Windows Phone 8 SDK at <http://www.windowsphone.com/en-us/how-to/wp8>  
<http://dev.windowsphone.com/en-us/>.

### Windows Azure SDK

You can download the Windows Azure SDK at <http://www.windowsazure.com/en-us/downloads/>.

## ALM Rangers Material

The ALM Rangers have a great deal of material that you will find helpful as you create your release pipeline.

- Visual Studio ALM Rangers, Visual Studio Test Tooling Guidance:  
<http://vsartesttoolingguide.codeplex.com/>
- Visual Studio ALM Rangers, *Visual Studio Lab Management Guide*:  
<http://vsarlabman.codeplex.com/>
- Visual Studio ALM Rangers, *Team Foundation Build Customization Guide*:  
<http://vsarbuildguide.codeplex.com/>
- Visual Studio ALM Rangers, *Visual Studio Team Foundation Server Branching and Merging Guide*: <http://vsarbranchingguide.codeplex.com/>
- Visual Studio ALM Rangers, *Visual Studio ALM Quick Reference Guidance*:  
<http://vsarquickguide.codeplex.com/>
- Visual Studio ALM Rangers: <http://msdn.microsoft.com/vstudio/ee358786.aspx>

## Standard IIS Configurations

This section is optional and is provided as a reference for Lab 3\_1. To ensure that you have the correct configurations, you can consult the IIS Configuration Reference at <http://www.iis.net/configreference>. You should also make sure that the WCF Service is **ON**.

This is a list of all the IIS services that need to be installed in order for the WCF service to work correctly.

| Display Name           | Name               | Install State |
|------------------------|--------------------|---------------|
| -----                  | ----               | -----         |
| [X] Application Server | Application-Server | Installed     |
| [X] .NET Framework 4.5 | AS-NET-Framework   | Installed     |

|  |                         |           |
|--|-------------------------|-----------|
| [X] Web Server (IIS) Support                       | AS-Web-Support          | Installed |
| [X] File And Storage Services                      | FileAndStorage-Services | Installed |
| [X] File and iSCSI Services                        | File-Services           | Installed |
| [X] File Server                                    | FS-FileServer           | Installed |
| [X] Storage Services                               | Storage-Services        | Installed |
| [X] Web Server (IIS)                               | Web-Server              | Installed |
| [X] Web Server                                     | Web-WebServer           | Installed |
| [X] Common HTTP Features                           | Web-Common-Http         | Installed |
| [X] Default Document                               | Web-Default-Doc         | Installed |
| [X] Directory Browsing                             | Web-Dir-Browsing        | Installed |
| [X] HTTP Errors                                    | Web-Http-Errors         | Installed |
| [X] Static Content                                 | Web-Static-Content      | Installed |
| [X] HTTP Redirection                               | Web-Http-Redirect       | Installed |
| [X] Health and Diagnostics                         | Web-Health              | Installed |
| [X] HTTP Logging                                   | Web-Http-Logging        | Installed |
| [X] Logging Tools                                  | Web-Log-Libraries       | Installed |
| [X] Request Monitor                                | Web-Request-Monitor     | Installed |
| [X] Performance                                    | Web-Performance         | Installed |
| [X] Static Content Compression                     | Web-Stat-Compression    | Installed |
| [X] Dynamic Content Compression                    | Web-Dyn-Compression     | Installed |
| [X] Security                                       | Web-Security            | Installed |
| [X] Request Filtering                              | Web-Filtering           | Installed |
| [X] Basic Authentication                           | Web-Basic-Auth          | Installed |
| [X] Client Certificate Mapping Authentic...        | Web-Client-Auth         | Installed |
| [X] Digest Authentication                          | Web-Digest-Auth         | Installed |
| [X] IIS Client Certificate Mapping Authe...        | Web-Cert-Auth           | Installed |
| [X] IP and Domain Restrictions                     | Web-IP-Security         | Installed |
| [X] URL Authorization                              | Web-Url-Auth            | Installed |
| [X] Windows Authentication                         | Web-Windows-Auth        | Installed |
| [X] Application Development                        | Web-App-Dev             | Installed |
| [X] .NET Extensibility 3.5                         | Web-Net-Ext             | Installed |
| [X] .NET Extensibility 4.5                         | Web-Net-Ext45           | Installed |
| [X] ASP.NET 3.5                                    | Web-Asp-Net             | Installed |
| [X] ASP.NET 4.5                                    | Web-Asp-Net45           | Installed |
| [X] ISAPI Extensions                               | Web-ISAPI-Ext           | Installed |
| [X] ISAPI Filters                                  | Web-ISAPI-Filter        | Installed |
| [X] IIS Hostable Web Core                          | Web-WHC                 | Installed |
| [X] Management Tools                               | Web-Mgmt-Tools          | Installed |
| [X] IIS Management Console                         | Web-Mgmt-Console        | Installed |
| [X] IIS Management Scripts and Tools               | Web-Scripting-Tools     | Installed |
| [X] .NET Framework 3.5 Features                    | NET-Framework-Features  | Installed |
| [X] .NET Framework 3.5 (includes .NET 2.0 and 3.0) | NET-Framework-Core      | Installed |
| [X] HTTP Activation                                | NET-HTTP-Activation     | Installed |
| [X] Non-HTTP Activation                            | NET-Non-HTTP-Activ      | Installed |
| [X] .NET Framework 4.5 Features                    | NET-Framework-45-Fea... | Installed |
| [X] .NET Framework 4.5                             | NET-Framework-45-Core   | Installed |
| [X] ASP.NET 4.5                                    | NET-Framework-45-ASPNET | Installed |
| [X] WCF Services                                   | NET-WCF-Services45      | Installed |
| [X] HTTP Activation                                | NET-WCF-HTTP-Activat... | Installed |

|   |                         |           |
|---|-------------------------|-----------|
| [X] Message Queuing (MSMQ) Activation             | NET-WCF-MSMQ-Activat... | Installed |
| [X] Named Pipe Activation                         | NET-WCF-Pipe-Activat... | Installed |
| [X] TCP Activation                                | NET-WCF-TCP-Activati... | Installed |
| [X] TCP Port Sharing                              | NET-WCF-TCP-PortShar... | Installed |
| [X] Message Queuing                               | MSMQ                    | Installed |
| [X] Message Queuing Services                      | MSMQ-Services           | Installed |
| [X] Message Queuing Server                        | MSMQ-Server             | Installed |
| [X] Remote Differential Compression               | RDC                     | Installed |
| [X] User Interfaces and Infrastructure            | User-Interfaces-Infra   | Installed |
| [X] Graphical Management Tools and Infrastructure | Server-Gui-Mgmt-Infra   | Installed |
| [X] Server Graphical Shell                        | Server-Gui-Shell        | Installed |
| [X] Windows PowerShell                            | PowerShellRoot          | Installed |
| [X] Windows PowerShell 3.0                        | PowerShell              | Installed |
| [X] Windows PowerShell 2.0 Engine                 | PowerShell-V2           | Installed |
| [X] Windows PowerShell ISE                        | PowerShell-ISE          | Installed |
| [X] Windows Process Activation Service            | WAS                     | Installed |
| [X] Process Model                                 | WAS-Process-Model       | Installed |
| [X] .NET Environment 3.5                          | WAS-NET-Environment     | Installed |
| [X] Configuration APIs                            | WAS-Config-APIs         | Installed |
| [X] WoW64 Support                                 | Wow64-Support           | Installed |

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