



Testing with Visual Studio 2013

Jason Chan
Developer Evangelist
Microsoft

Agenda

Test Planning & Manual Testing

- Microsoft Test Manager (MTM)
- Manual and exploratory testing with MTM

Performance & Automated Testing

- Performance Profiling
- Unit Tests
- Coded UI Test
- Web Performance Test
- Load Test

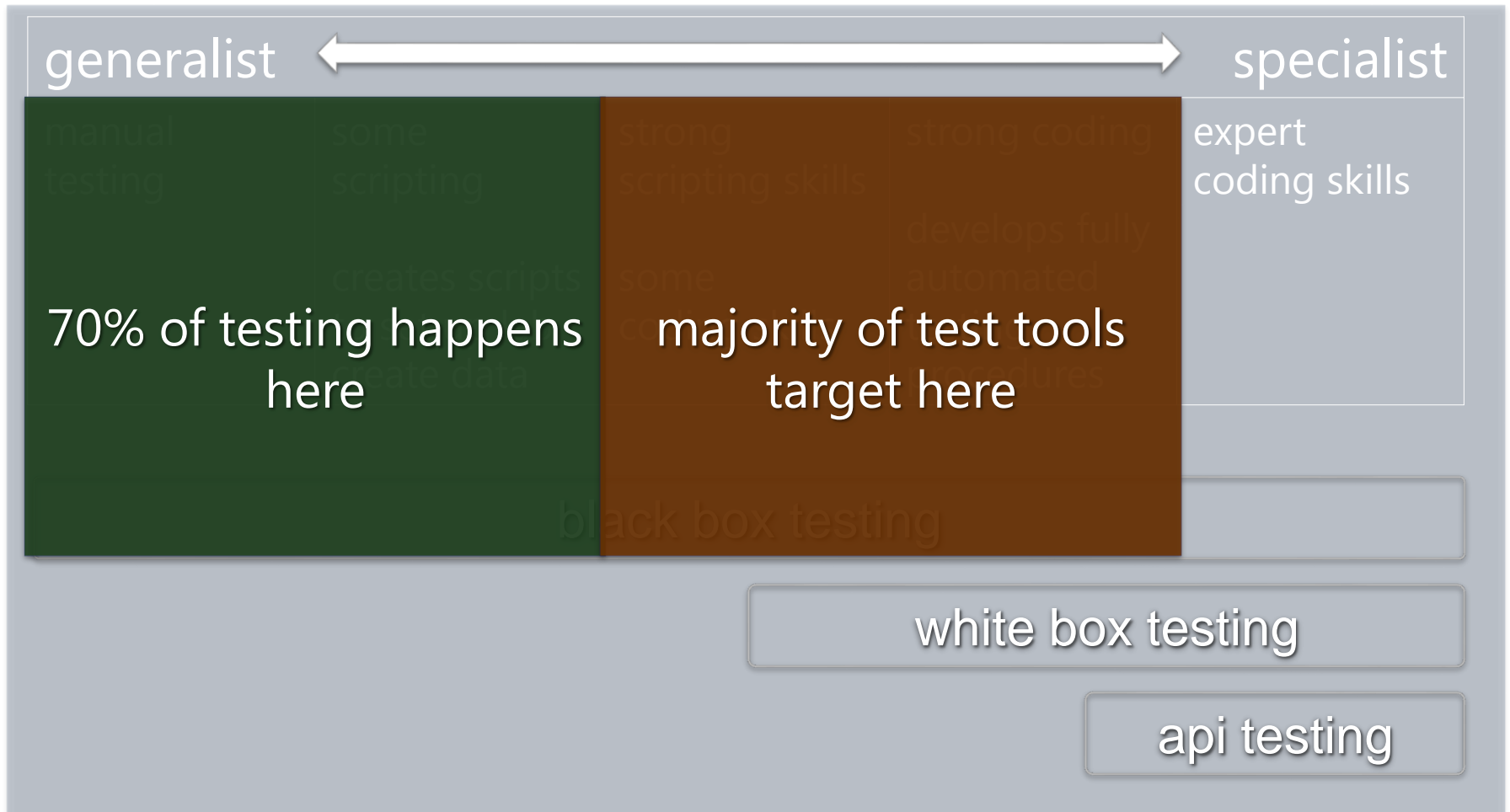
Continuous build and test

- Team Foundation Server (TFS)
- Built-in TFS reports

Test Automation

- Why Automate Test?
 - Testing is Labor and Time Intensive
 - Expensive
 - Repetitive and BORING
 - Human error prone
- Advantage
 - Write once, test many times
 - Can be incorporated into builds
 - Enable test config by non technical staff (Microsoft Test Manager)
 - Greatly reduces testing time

Tester Segmentation



VS2013 Ultimate **Test** Goals

Align QA **with** the Lifecycle

Create **tighter** Dev/Test
interaction

Enable highly **leveraged QA Org.**

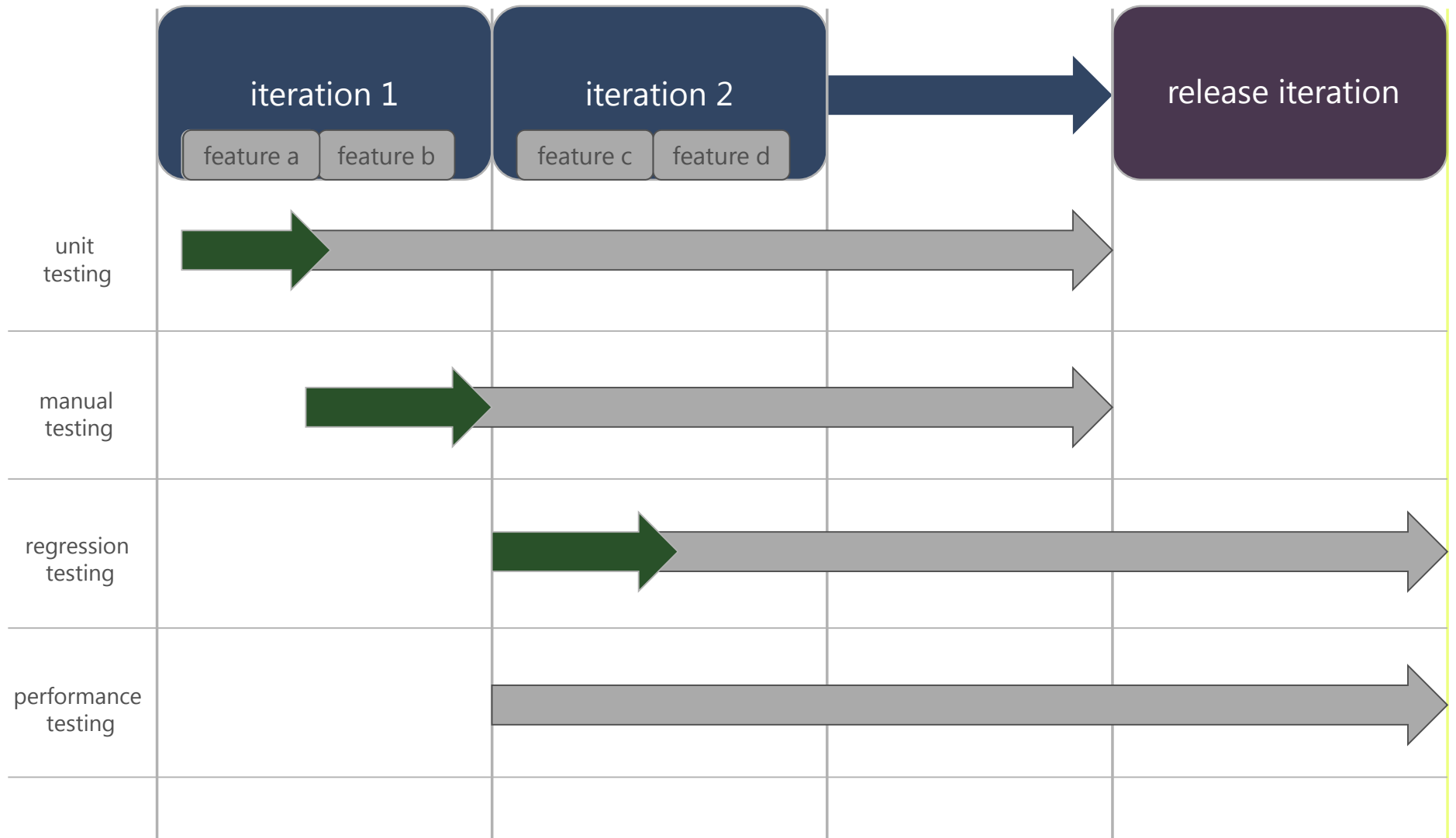


Manual Testing & Automated Testing

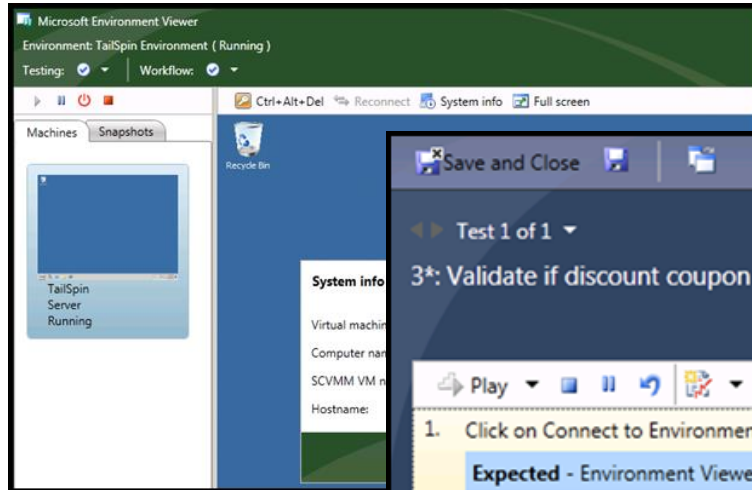
Microsoft Test Manager

- Test Planning
- Define requirements and test cases
- User friendly (QA team and testers)
- Perform Manual Testing
- Exploratory Testing
- Integrates with Team Foundation Server
- Part of Test Professional, Premium, Ultimate

Automation Strategy



File Bug with Environment Snapshot



Save and Close

Test 1 of 1

3*: Validate if discount coupon is applied

Windows 7 and IE 8

Play [Icons]

- Click on Connect to Environment
Expected - Environment Viewer opens up
- Click on the System Info, and copy the computer name
- Open Internet Explorer (IE)
- Type the URL as `http://<ComputerName>/tailspin.web/default.aspx`
- Click on Model Airplanes on the top of page
- Click on BlueYonder Airlines
- Click on Add Item to Cart
- Enter Discount Coupon as "FLY-DISCOUNT" and click Go
- Checkout the items and click Continue to proceed for Billing
- Close IE

End test

Details System Info Test Cases All Links Attachments

Steps to Reproduce:

Segoe UI 2

Expected result: Computer name of the TailSpin Server is copied to clipboard

- Passed** Open Internet Explorer (IE)
Expected result: IE opens up
- Passed** Type the URL as `http://<ComputerName>/tailspin.web/default.aspx`
Expected result: TailSpin application home page opens up
- Passed** Click on Model Airplanes on the top of page
Expected result: List of model airplanes is shown
- Passed** Click on BlueYonder Airlines
Expected result: Blue Yonder airlines details page opens up
- Passed** Click on Add Item to Cart
Expected result: Your cart is added with BlueYonder Airplane
- Failed** Enter Discount Coupon as "FLY-DISCOUNT" and click Go
Expected result: Discount should be applied
Comments: Webpage shows a Server Error.
Attachments: [Screenshot1 \(TC3Iteration1Step8\).png](#), [TC3Snapshot1.jpg](#)
- None** Checkout the items and click Continue to proceed for Billing
Expected result: Page asking for shipping information is shown
- None** Close IE
Expected result: TailSpin Home page is closed

Test settings intro

- map data adapters to environment roles
- configure role on which to run tests
- specify settings for each adapter
 - collection profile for the role
 - limit data collected for each role

Diagnostic data adapters

data adapter	description
actions	use to collect each UI action you perform as you run a test (for client roles only)
asp.net client proxy for intellitrace and testimpact	use for web applications when you select intellitrace or testimpact for a server role (use on client to web server)
eventlog	use to capture event log data (for client or server roles)
intellitrace	use to collect exceptions and specific diagnostic tracing information to help isolate bugs that are difficult to reproduce (for client or server roles)
network emulation	use to emulate slower networks when you run your tests (for client or server roles)
system information	use to collect system information for a machine (for client or server roles)
test impact	use to collect information that can help you decide which tests to rerun based on changes made to an application for a specific build (for client or server roles)
video recorder	use to create a video recording of your desktop session while you run a test (for client roles only)



Demo

Microsoft Test Manager

Performance Profiling

Full feature profiling support

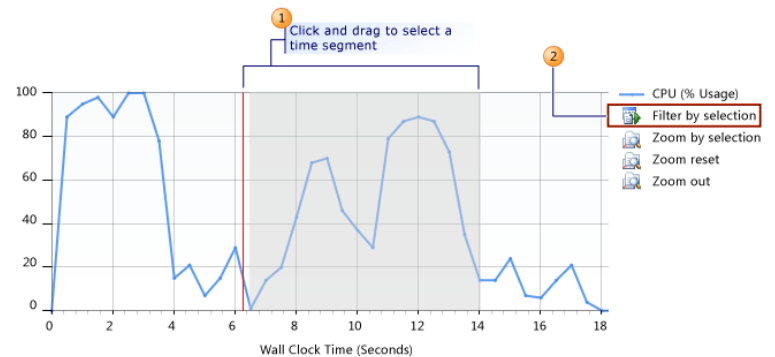
Hot Path: the list of functions that are doing the most work

Summary Timeline provides an overview of code performance

Hot Path

The most expensive call path based on sample counts

Function Name	Inclusive Samples %	Exclusive Samples %
PeopleTrax.exe	100.00	0.00
PeopleTrax.Form1.Main()	99.83	0.00
System.Windows.Forms.Application.Run(class System.Win...	99.33	0.83
PeopleTrax.Form1.GetPeopleButton_Click(object, class...	95.17	0.00
PeopleNS.People.GetPeople(int32)	94.33	0.00
PeopleNS.People.GetNames(class System.Resou...	93.67	3.83
System.IO.StringReader.ReadLine()	56.50	56.50
System.String.Trim()	22.00	22.00



Profiling Methods

Sampling

- Gathers information at intervals (clock cycles)
- No code modifications
- Use this for first pass explorations

Instrumentation

- Modifies your code
- Gathers detailed timing and count information

Concurrency

- Multi-threaded code profiling

.NET Memory

- Object creation
- Garbage collection

Tier Interaction

- Interaction between your application and SQL Server via ADO.NET

Tier Interactions

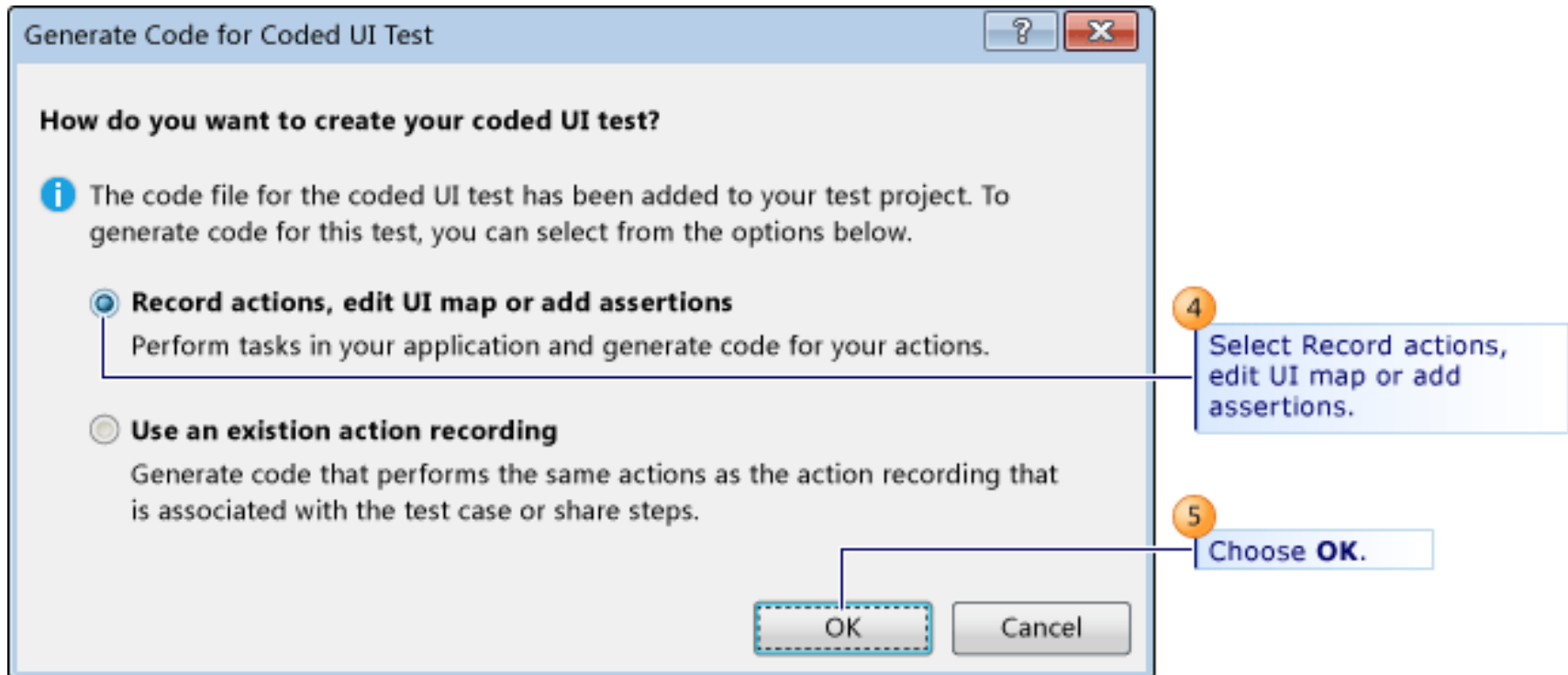
When the application was running, the BrowseArticles.aspx page was requested 2 times for a total of 319.23 msc

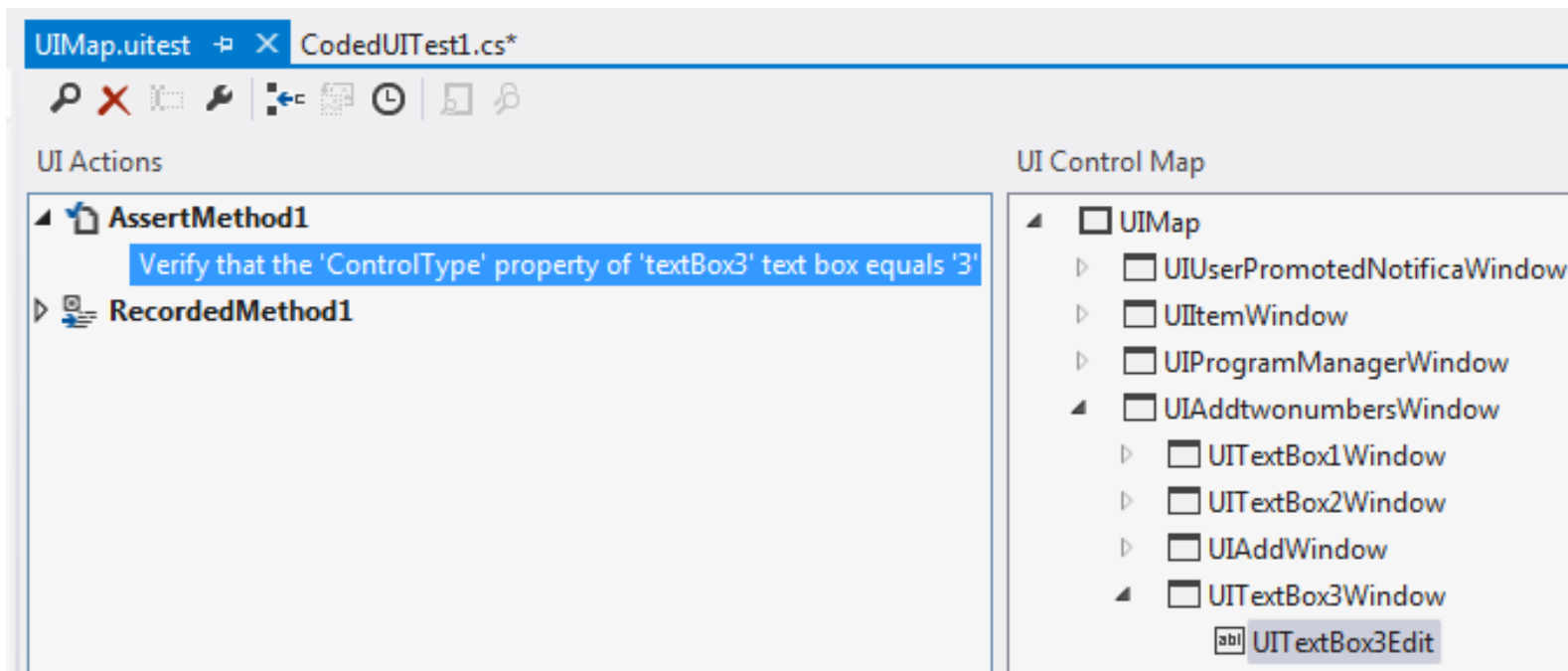
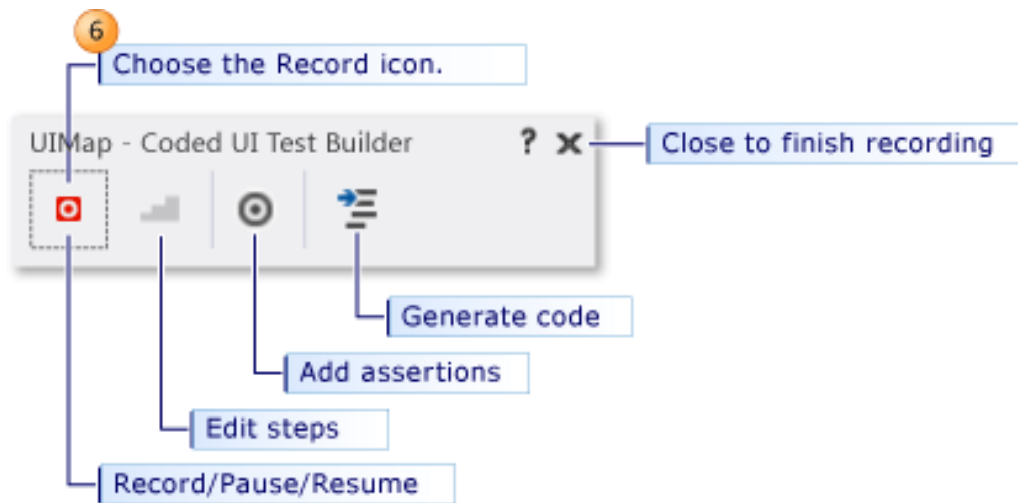
Name	Count	Total Elapsed ...	Min Elapsed Time	Max Elapsed Time
/TBH_Web/default.aspx	1 Request	7,236.18	7,236.18	7,236.18
/TBH_Web/GetArticlesRss.aspx	4 Requests	723.85	8.58	52.57
/TBH_Web/BrowseArticles.aspx	2 Requests	319.23	52.57	217.29
Database Connections				
\\.\pipe\A88BA1A2-A5FB-4C\tsql\query	11 Queries	50.09	1.40	186.59
/TBH_Web/GetProductsRss.aspx	4 Requests	217.29	1.40	217.29
/TBH_Web/ShowCategories.aspx	1 Request	186.59	186.59	186.59
/TBH_Web/Images/Question.gif	1 Request	110.72	110.72	110.72
/TBH_Web/Images/Diary.gif	1 Request	110.72	110.72	110.72
/TBH_Web/GetThreadsRss.aspx	4 Requests	110.72	110.72	110.72
/TBH_Web/WebResource.axd	4 Requests	110.72	110.72	110.72
/TBH_Web/App_Themes/TemplateMo	2 Requests	110.72	110.72	110.72
/TBH_Web/images/stars40.gif	2 Requests	110.72	110.72	110.72

The BrowseArticles.aspx page made 11 calls into a database which took 50.09 msec. You can see all 11 database queries in this pane.

Command Text	Query Calls	Total Elapsed ...	Min Elapsed Time	Max Elapsed Time	Avg Elapsed Time
dbo.aspnet_Profile_GetProperties	2	27.83	2.49	25.34	13.91
tbh_Articles_GetPublishedArticlesByCategory	2	8.35	1.66	6.70	4.17
dbo.aspnet_Profile_SetProperties	2	5.09	2.11	2.98	2.54
tbh_Articles_GetPublishedArticles	1	2.59	2.59	2.59	2.59
dbo.aspnet_PersonalizationAllUsers_GetPageSettings	2	2.42	1.03	1.38	1.20
tbh_Articles_GetArticleCount	1	1.96	1.96	1.96	1.96
tbh_Articles_GetPublishedArticleCountByCategory	1	1.85	1.85	1.85	1.85

Coded UI Test







Demo

Coded UI Test

Web Performance Test?

- Records Http traffic
- Building block of Load Tests
- Helps to organize your suite
- Should simulate a User Story
 - As an administrator, I need to search for a person by username so that I can deactivate that person's account.
 - As a customer, I want to order a pizza and pay with a credit card.

Load Modeling & Testing

Flexible Load Modeling

- Enables easily simulating different user groups
- Goal-based, step, constant, and custom load patterns
- Model different browsers and networks

Efficient Load Generation

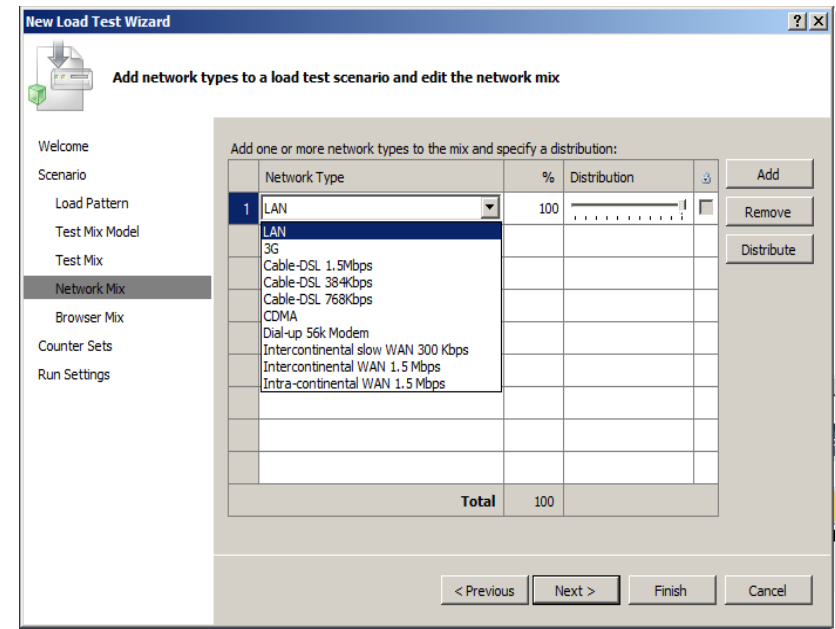
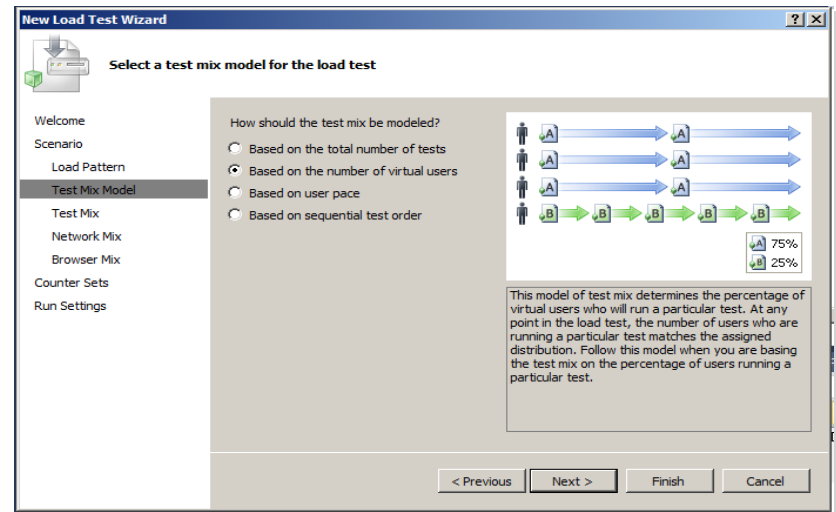
- Minimal hardware investments
- Scale-out load generation

Integrated and Extensible Data Collection

- Performance Counter Sets capture key measurements
- Test results stored in SQL for custom reporting
- Data collectors allow custom log capture

Load Modeling

- “Scenarios” for modeling different user groups
- Step, goal-based, constant, and custom load patterns
- Duration-based and iteration based
- Ability to simulate different browsers and networks



Data-driven

- Run web test once per row in data source
- Simulate multiple, concurrent users
- Data source types
 - OLE DB, CSV, XML
- Parameterization
- Better tests, better coverage



Demo

Web Performance Test

What are Load Tests?

- Mix of Web Performance and Unit Tests
- Simulates a mix of users doing a mix of things
- Simulate
 - Network speeds
 - Different browsers
 - Varying user activity loads

Two ways to run load tests

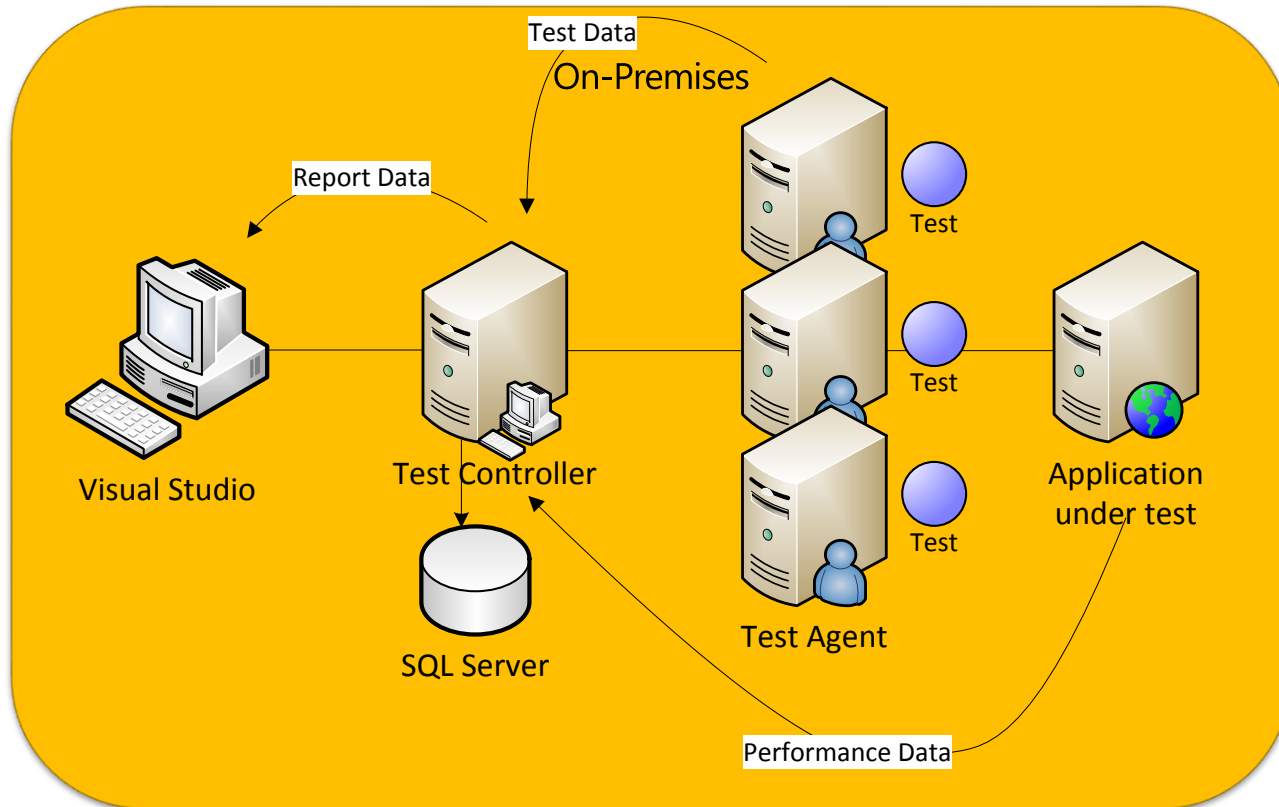
- From Visual Studio 2012
 - Developer's machine / server
- Generate load from test agents
 - Highly Scalable



Demo

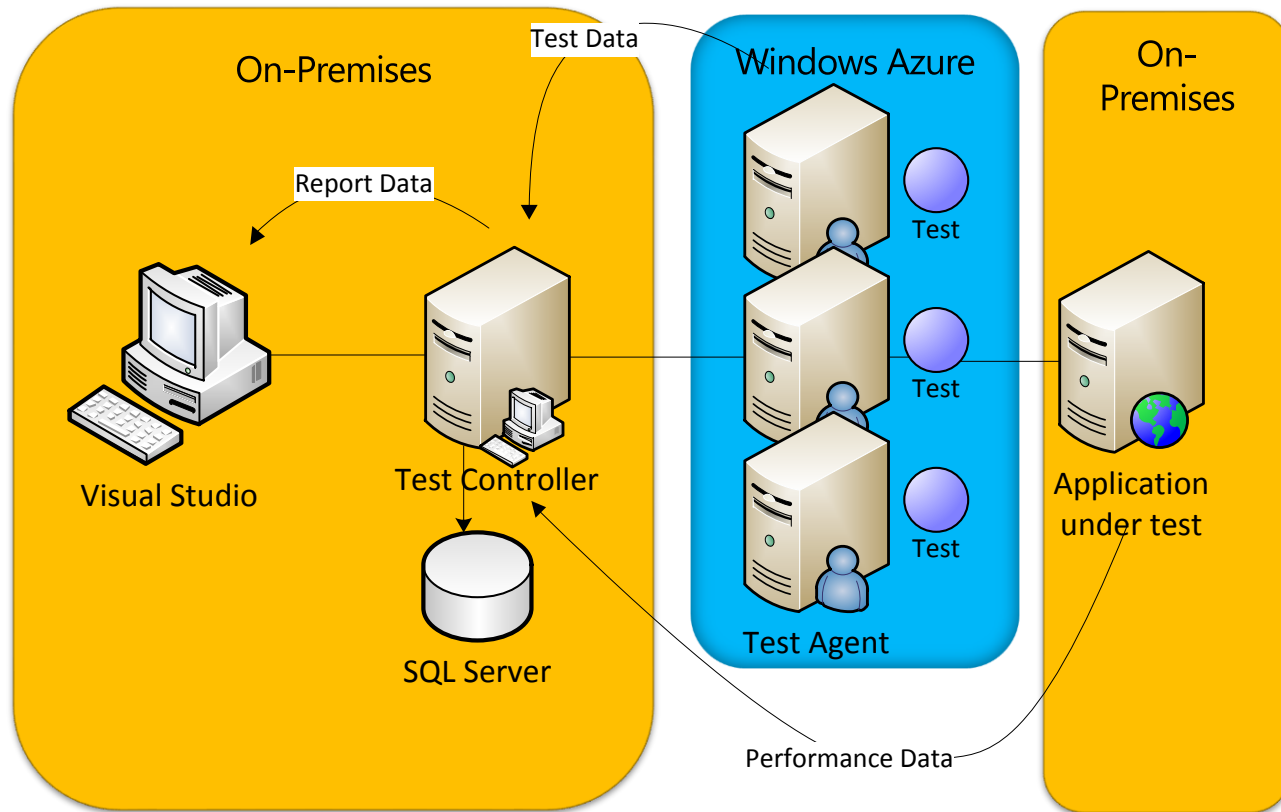
Load Test

Visual Studio Load Testing



Load generated on-premises – traditional approach

Visual Studio Load Testing with Azure



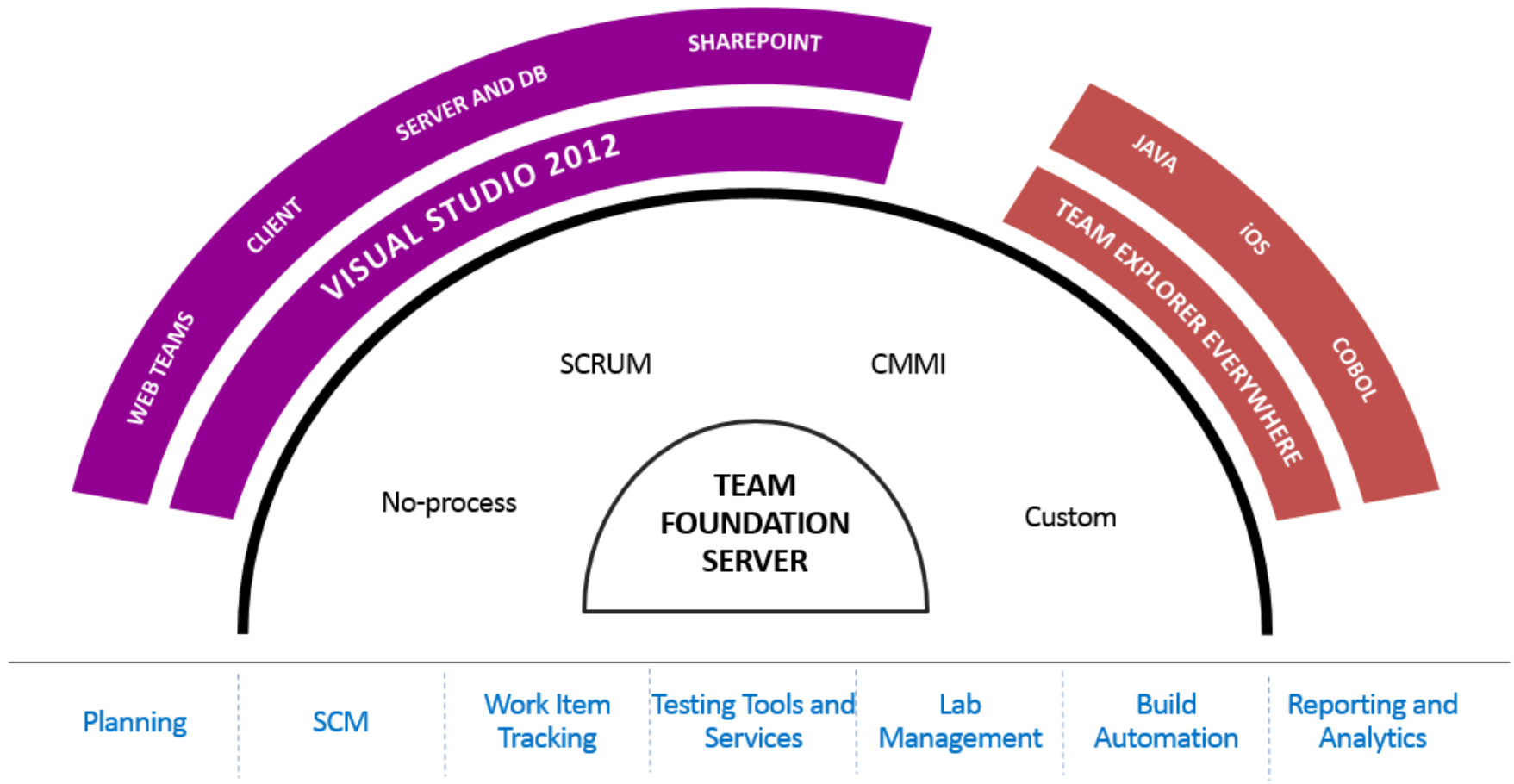
Load generated by agents in the cloud, controller on-premises

Analysis & Extensibility

- Performance Analysis
 - Correlate of server activity with performance measurements
 - Drill into error logs
 - Performance reports integrated in Excel
 - Visualize virtual user activity
- Generate code from recordings
- Load test plugin allow control of nearly all aspects of the load test

Team Foundation Server

Team Foundation Server (TFS) Features



General

Trigger

Workspace

Build Defaults

Process

Retention Policy

Select one of the following check-in triggers:

- Manual - Check-ins do not trigger a new build
- Continuous Integration - Build each check-in
- Rolling builds - accumulate check-ins until the prior build finishes
 - Build no more often than every minutes.
- Gated Check-in - accept check-ins only if the submitted changes merge and build successfully
 - Merge and build up to submissions.
- Schedule - build every week on the following days
 - Monday Tuesday Wednesday Thursday
 - Friday Saturday Sunday


Queue the build on the build controller at:

Pacific Standard Time (GMT -08:00)

- Build even if nothing has changed since the previous build

Email Alerts

...kamFiber ▾ Julia Iliyana ▾ ⚙



Julia Iliyana
julia@fabrikamfiber.com

Manage Profile
Manage Alerts
Sign in as Different User Manage Alerts
Sign Out

Submit Feedback

MANAGE TFS ALERTS ✕

Send My Alerts To ([Edit...](#))
julia@fabrikamfiber.com

Team alerts can be managed from the [Advanced Alerts Management Page](#)

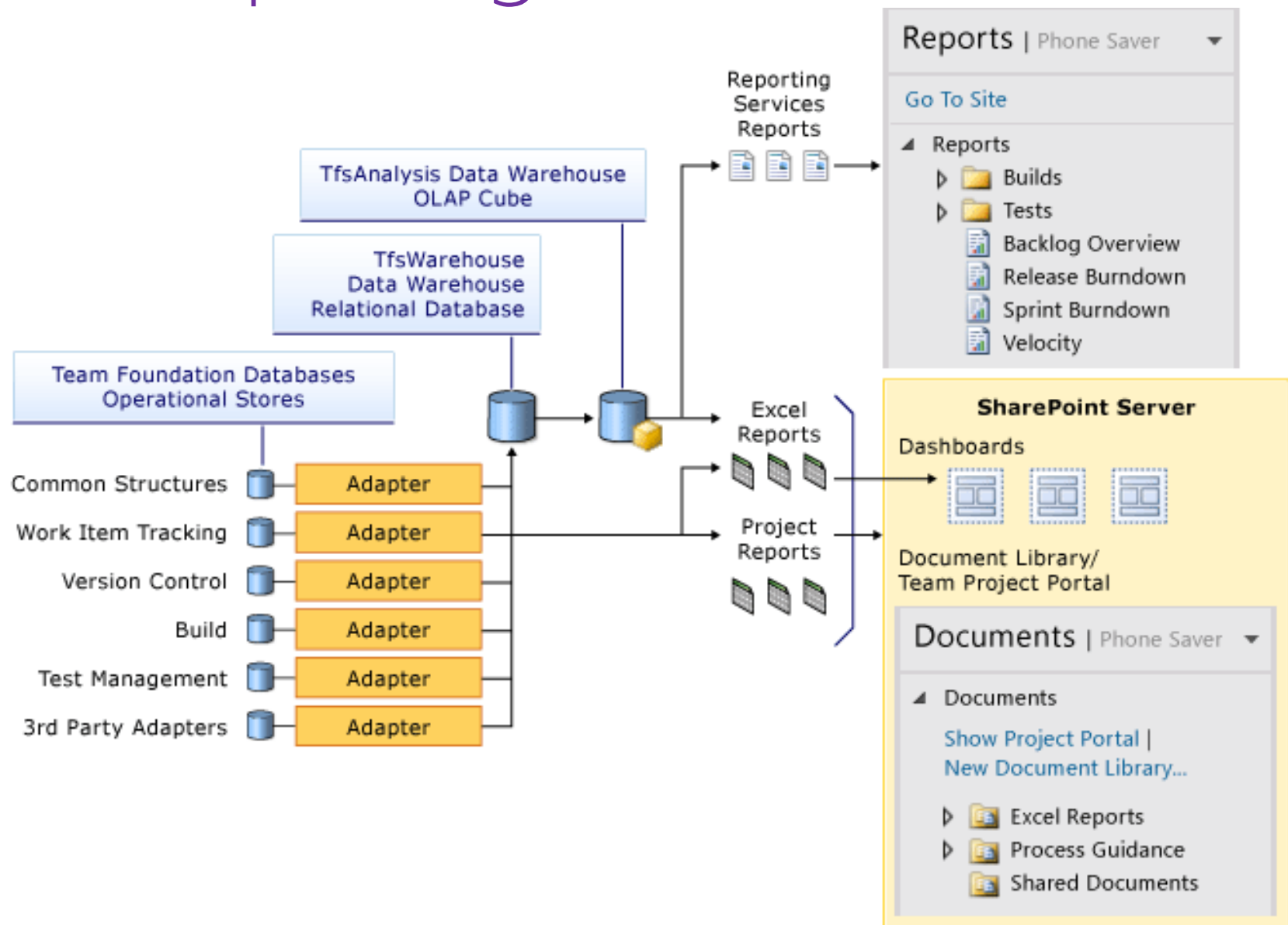
BASIC ALERTS CUSTOM ALERTS

Send me an email alert when

- My work items are changed by others
- Anything is checked in
- Any build completes
- My build completes
- A build quality changes
- A code review I am working on changes

Close

TFS Reporting



Visual Studio Automated Testing



- Coded UI Test and Web Performance / Load Test
- Generate code from action recordings
- Replay and assert
- Extensible
- Integrated with Team Foundation Server
- Bug Tracking
- Continuous, scheduled builds and tests

Summary

- Automating tests reduces error and saves time
- Plan ahead for testing / automation strategy and roadmap
- Test early, test often
- Use Coded UI Tests for regression tests
- Use Load test for Capacity planning and performance health check regularly
- Manual test after each product milestone