

Microsoft's Team Foundation Server (TFS)

Canute Magalhaes

Richland County (IT)

SYSTEMS ANALYST / PROJECT LEAD

Topics for this Presentation

- Why Richland County IT - Business Systems Division uses Team Foundation Server (TFS)

- What is Team Foundation Server

- Version Control with TFS

- Automating Builds with TFS

- Programmatically Interfacing with TFS

- Demo a triggered build

- Questions

Why Richland County IT - Business Systems Division uses TFS - Challenges

- Possibility of more than one user working on a file simultaneously.
- Need file / code synchronization, repository, history, authorization, etc.
- Need developers working as a group, doing building, code trails, System Integration and Functionality testing.
- Nice to have an Early Notification of bad checked-In code.
- Cannot have a Single Point Of Failure, with work-in-process files sitting on local machine.
- Need designated teams managing their respective builds without developer involvement.
- Did not have consolidated environment for version control, repository, build process etc.
- Need to run builds under an authorized account

Multiple solutions under one Umbrella

TFS

- We are a Microsoft shop.
- We have TFS in our MSDN subscription.
- Multi-User Check-outs
- File / code synchronization, repository, history, authorization, etc.
- Developers can doing development builds for System integration and functionality testing with version control.
- ShelveSet lets you save work-in-process files on to the TFS server.
- Analysts now determine and manage QA builds without developer involvement.
- Builds are kicked off and pushed to Staging and Production under an authorized account by the concerned groups.
- One consolidated environment for version control, repository, build process etc. Run under an authorized account.

What is Team Foundation Server (TFS)

Team Foundation Server is the collaboration platform at the core of Microsoft's Application Lifecycle Management (ALM) solution.

Source <http://msdn.microsoft.com/en-us/vstudio/ff637362.aspx>

Team Foundation Server Releases

Pre - 2013 release

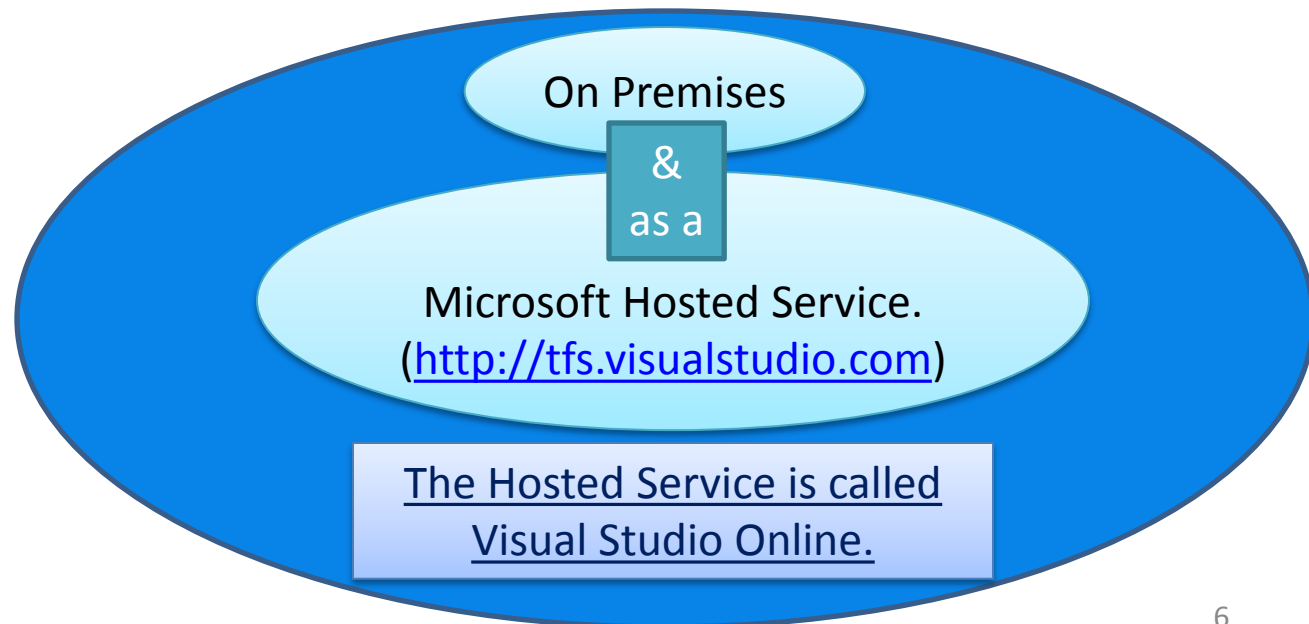


Team Foundation Server

2013 and forward



Team Foundation Server / Service



Team Foundation Server Architecture

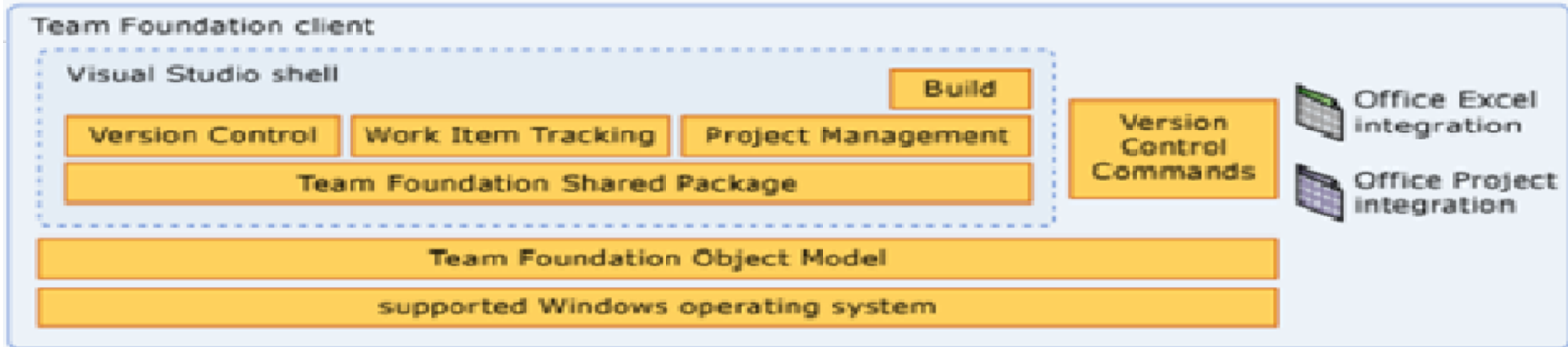
Team Foundation Server has three logical tiers

- Client tier

- Application tier

- Data tier

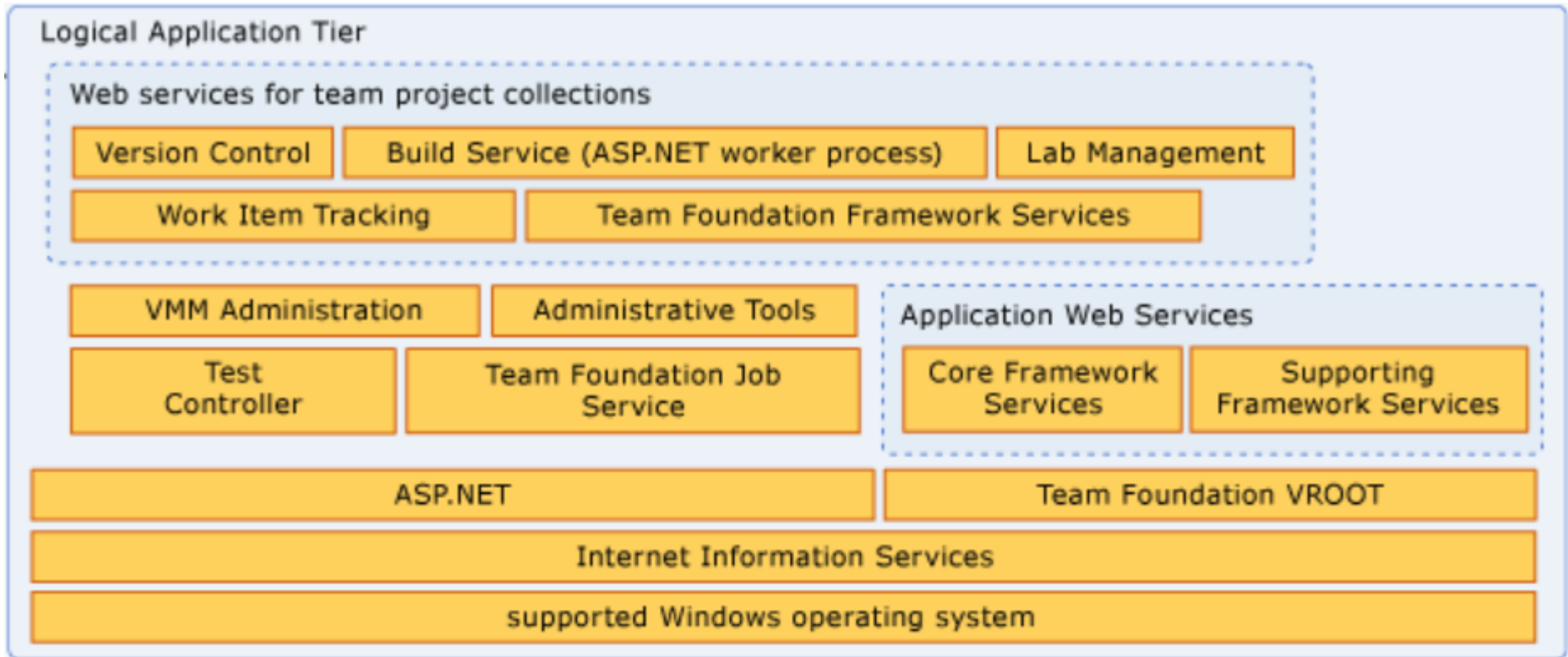
Client Tier



The client tier consists of Visual Studio Industry Partners (VSIP) components, Microsoft Office integration, command-line interfaces, etc.

VSIPs: Applied Materials, App Dev, github, etc.

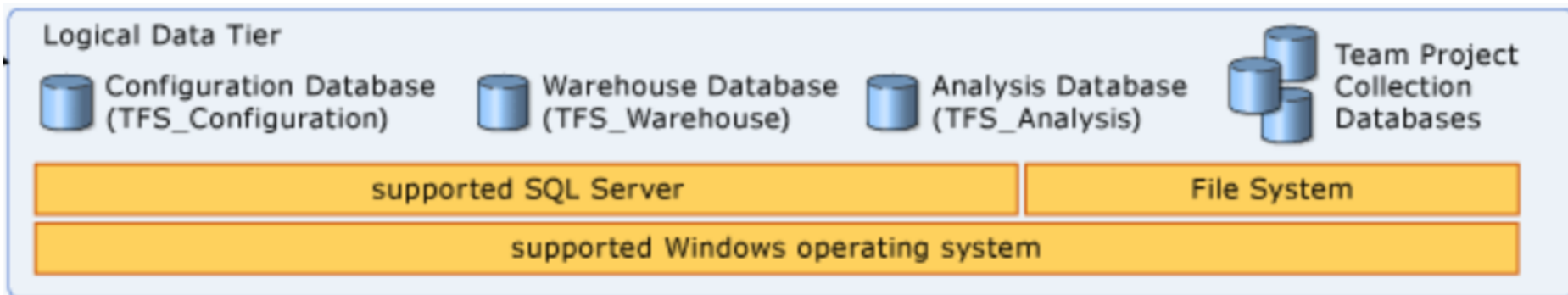
Application Tier



Server-level services (also known as application-level services) provide the functionality for operations for Team Foundation Server as a software application.

The client tier communicates with the application tier through the server object model, and uses the same Web services that are listed for that tier. This is true whether you deploy TFS locally, or if you use Visual Studio Online.

Data Tier



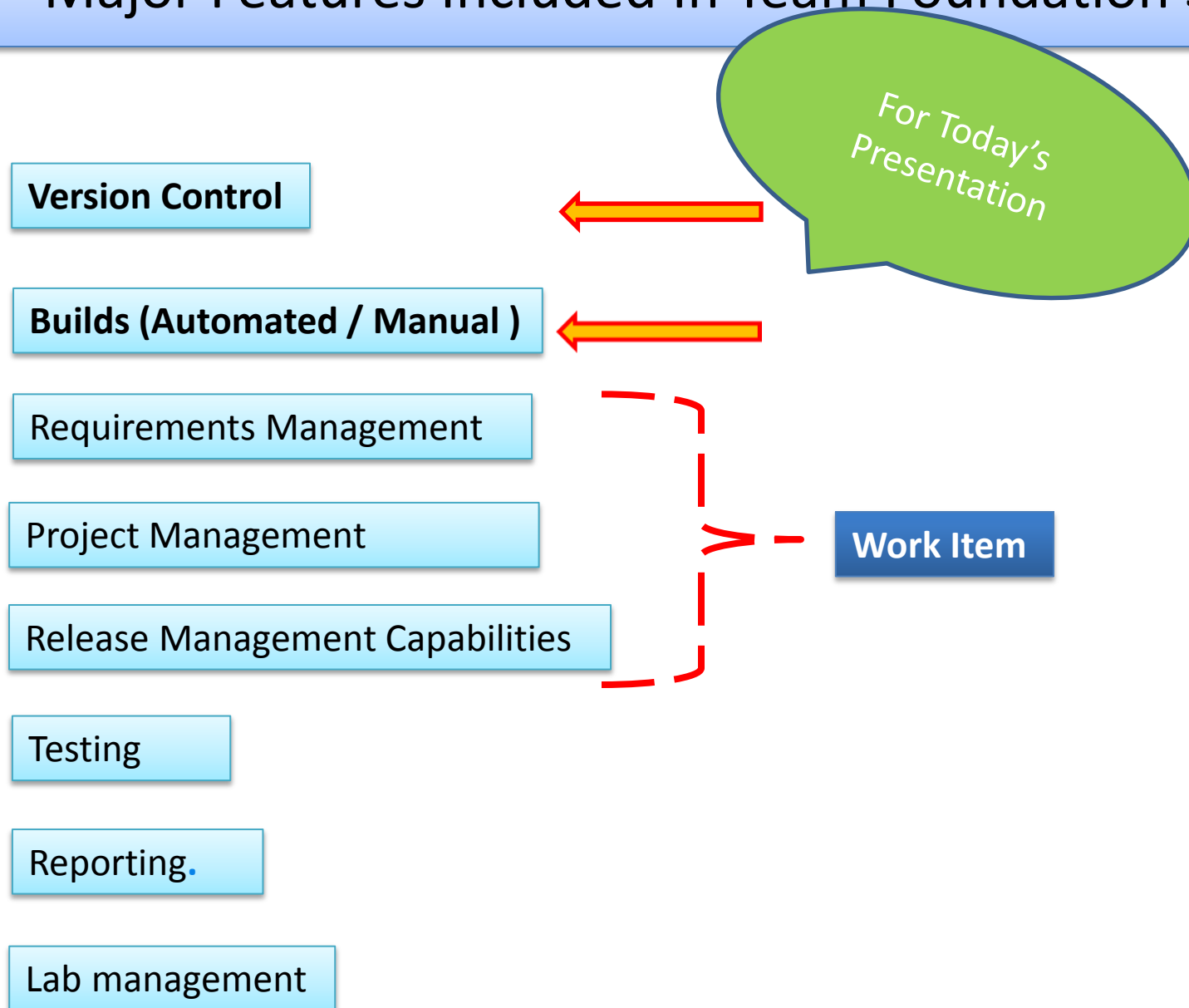
The data tier includes data, stored procedures, and other associated logic. When you use Visual Studio Online, the data tier is hosted for you using SQL Server Azure. In a local deployment of TFS, the logical data tier consists of the operational stores within SQL Server.

- Configuration database (**TFS_Configuration**)
- Application warehouse (**TFS_Warehouse**)
- Analysis Services database (**TFS_Analysis**)
- Databases for team project collections (**TFS_CollectionName**)

These stores might be located on one physical server or distributed across many servers.

Source: <http://msdn.microsoft.com/en-us/library/ms252473.aspx>

Major Features Included In Team Foundation Server



Connecting to Team Foundation Server

Team Foundation Server Administration Console

Visual Studio IDE

Team Web Access

Team Explorer Everywhere

Team Foundation Server Administration Console

The screenshot displays the Team Foundation Server Administration Console interface. The left-hand navigation pane shows a tree view with the following items: DEVTTFSS1, Application Tier (selected), Team Project Collections, SharePoint Web Applications, Reporting, Lab Management, Proxy Server, Team Foundation Backups, Build Configuration, and Logs. The main content area is titled "Application Tier" and includes a "Refresh" button and a "Help" icon. It is divided into three sections:

- Application Tier Summary:** A table of configuration details.

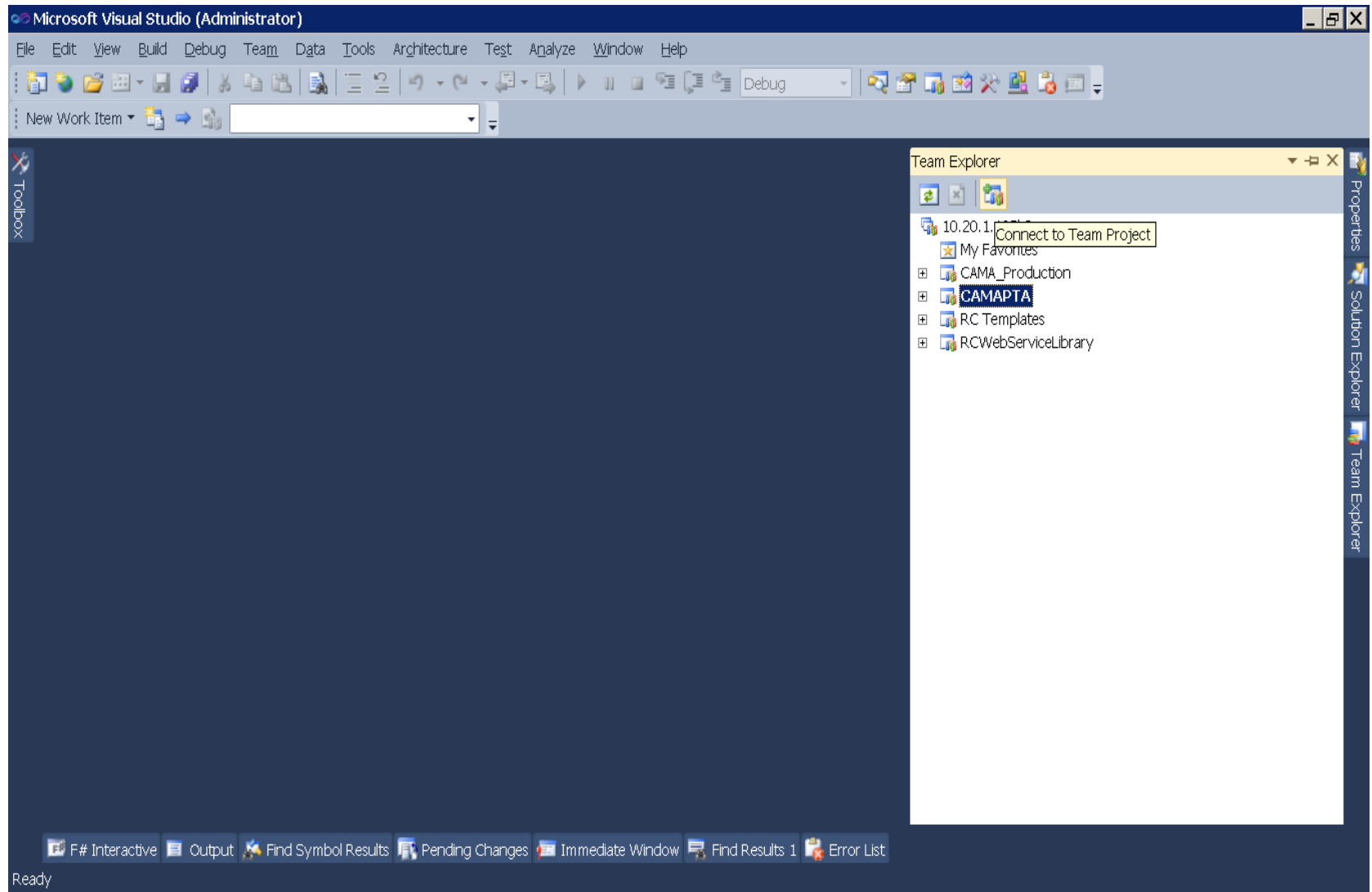
Service Account:	COUNTY_TFS_Service
Web Site:	Team Foundation Server
Application Pool:	Microsoft Team Foundation Server Application Pool
Authentication:	Negotiate (Kerberos)
Notification URL:	http://(devtffs1):8080/tfs
Server URL:	http://localhost:8080/tfs
Web Access URL:	http://(devtffs1):8080/tfs/web
Machine Name:	DEVTTFSS1
Ports:	8080
Virtual Directory:	/tfs
Version:	10.0.40219.1 (SP1 KB2462621)
- Administration Console Users:** A table listing users.

User Name
COUNTY_TFS_Service
- Email Alert Settings:** Configuration for email alerts.

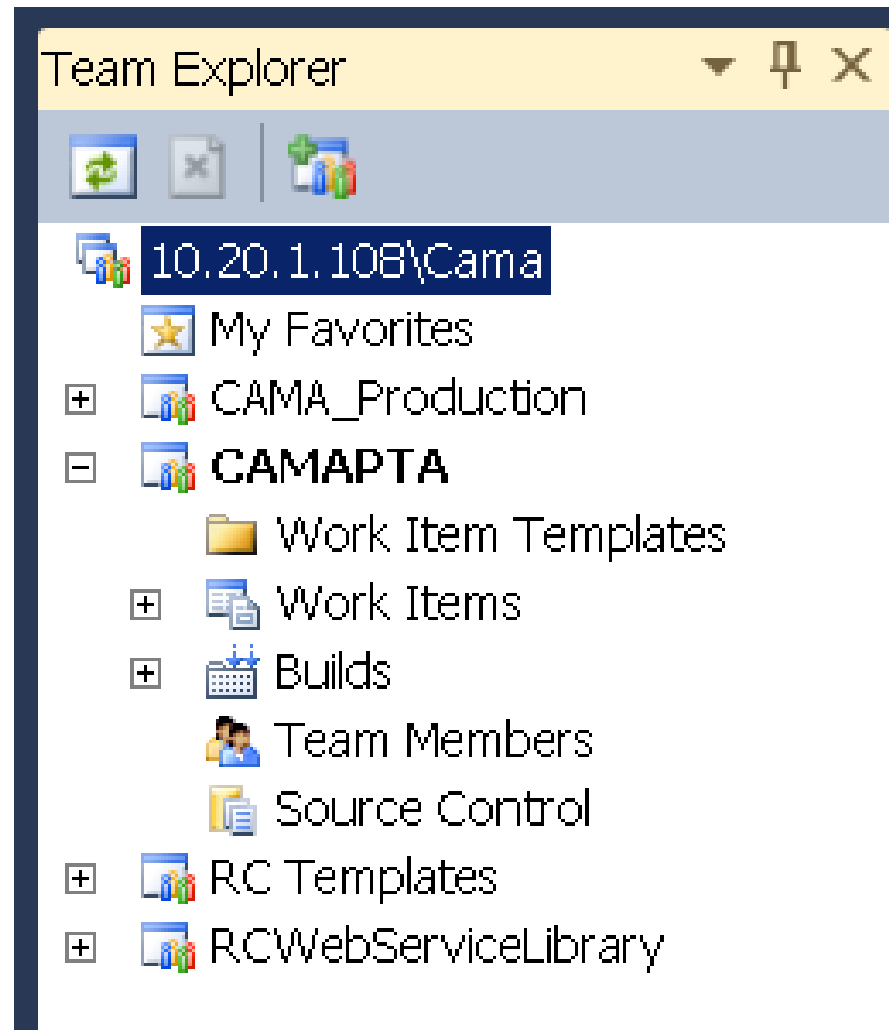
Enabled:	True
SMTP Server:	pluto.county.rogov.edu

On the right side of the console, there are several action buttons: Update Password, Change Account, Reapply Account, Authentication Settings, Group Membership, Administer Security, Change URLs, Add, Remove, Reapply, and Alert Settings.

Via Visual Studio



Team Explorer packaged with Visual Studio



Team Web Access

The screenshot displays the Microsoft Visual Studio 2010 Team Web Access interface. The browser window title is "CAMAPTA - Team Web Access - Windows Internet Explorer" and the address bar shows "http://devtftfs1:8080/tfs/web/Index.aspx". The interface includes a navigation menu with "Home", "Work Items", "Source", and "Build" tabs. The left sidebar shows the user "Canute Magalhaes" and the team "CAMAPTA (Cama)". Below the sidebar is a search box and three sections: "Favorites", "New Work Item", and "Queries", each with "No recent items." The main content area shows the "CAMAPTA" team name, followed by icons for "Queries", "Source Control", and "Build". Below this is a "Work Items Summary (My work items)" section with a "Customize | Refresh" link. The summary shows "10 Bug" and "10 Active" work items.

Microsoft Visual Studio 2010 Team Web Access

Home Work Items Source Build

Canute Magalhaes

CAMAPTA (Cama)

Enter search text Search

Favorites No recent items.

New Work Item No recent items.

Queries No recent items.

CAMAPTA

Queries Source Control Build

Work Items Summary (My work items) Customize | Refresh

10 Bug
10 Active

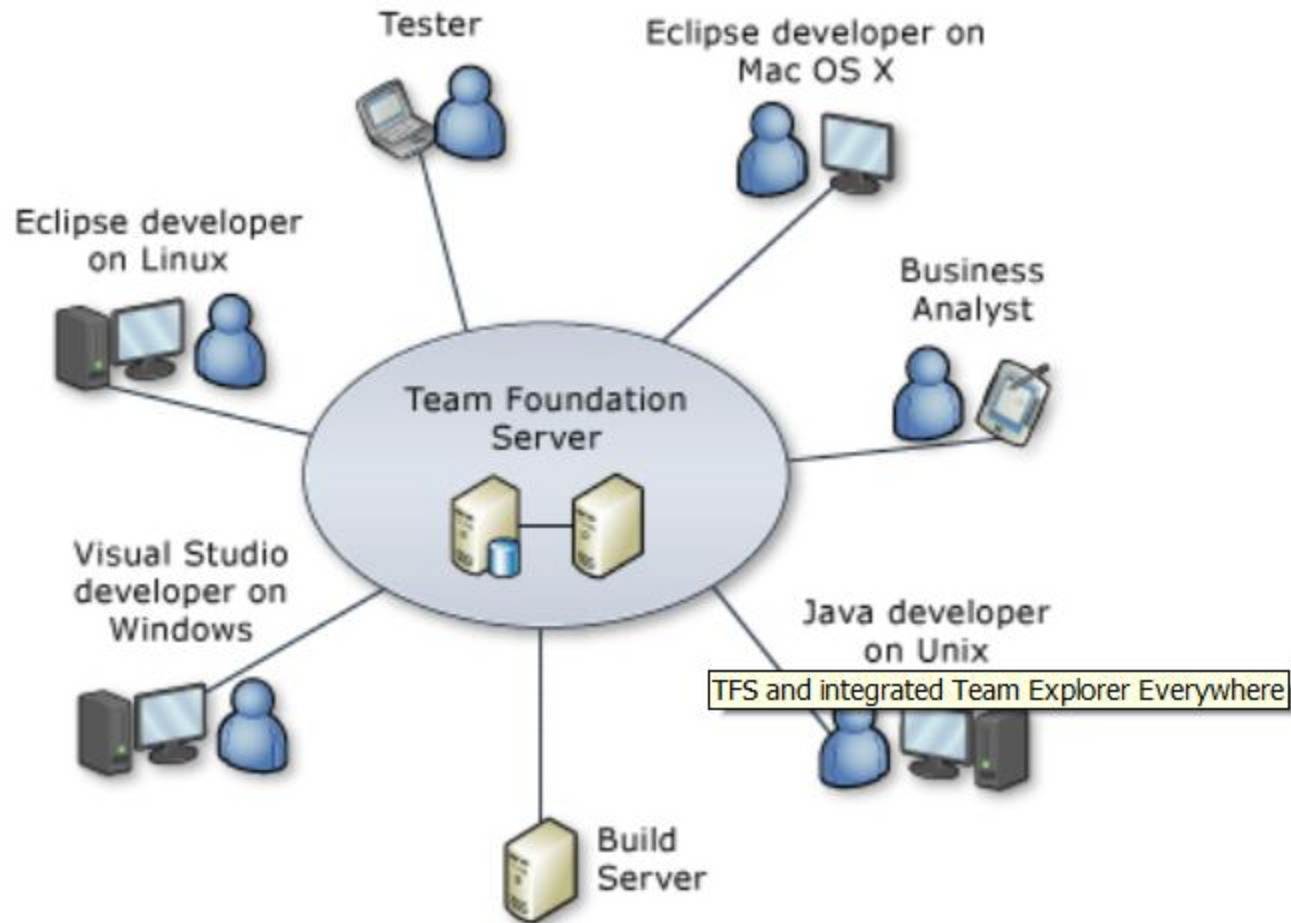
Check-In, Check-Out from Team Foundation Server without an IDE ?

Team Explorer Everywhere

Download Available:

<http://www.visualstudio.com/en-us/downloads#d-team-explorer-everywhere>

According to Microsoft: Your team can collaborate across platforms and improve the predictability of your development processes by using Team Explorer Everywhere.



How to get started with Team Explorer Everywhere:

<http://msdn.microsoft.com/en-us/library/gg413285.aspx>

Team Foundation Server Administration Console - Details

The screenshot shows the Team Foundation Server Administration Console interface. The left sidebar contains a tree view of the server structure, with 'Team Project Collections' selected. The main area displays a table of collections:

Name	State
Cama	Online
RC	Online

Below the table, the details for the 'Cama' collection are shown:

Cama
URL: <http://devittfs1:8080/tfs/Cama/>
SQL Server Instance: PRODITSQL3\PRODSQL

On the right side of the console, there are buttons for 'Create Collection' and 'Attach Collection'. Below the details pane, there are buttons for 'Stop Collection', 'Edit Settings', 'Group Membership', 'Administer Security', and 'Detach Collection'.

Team Projects In Collection

The screenshot displays the Team Foundation Server Administration Console. The left-hand navigation pane shows the 'Application Tier' expanded to 'Team Project Collections'. The main content area is titled 'Team Project Collections' and features a table with the following data:

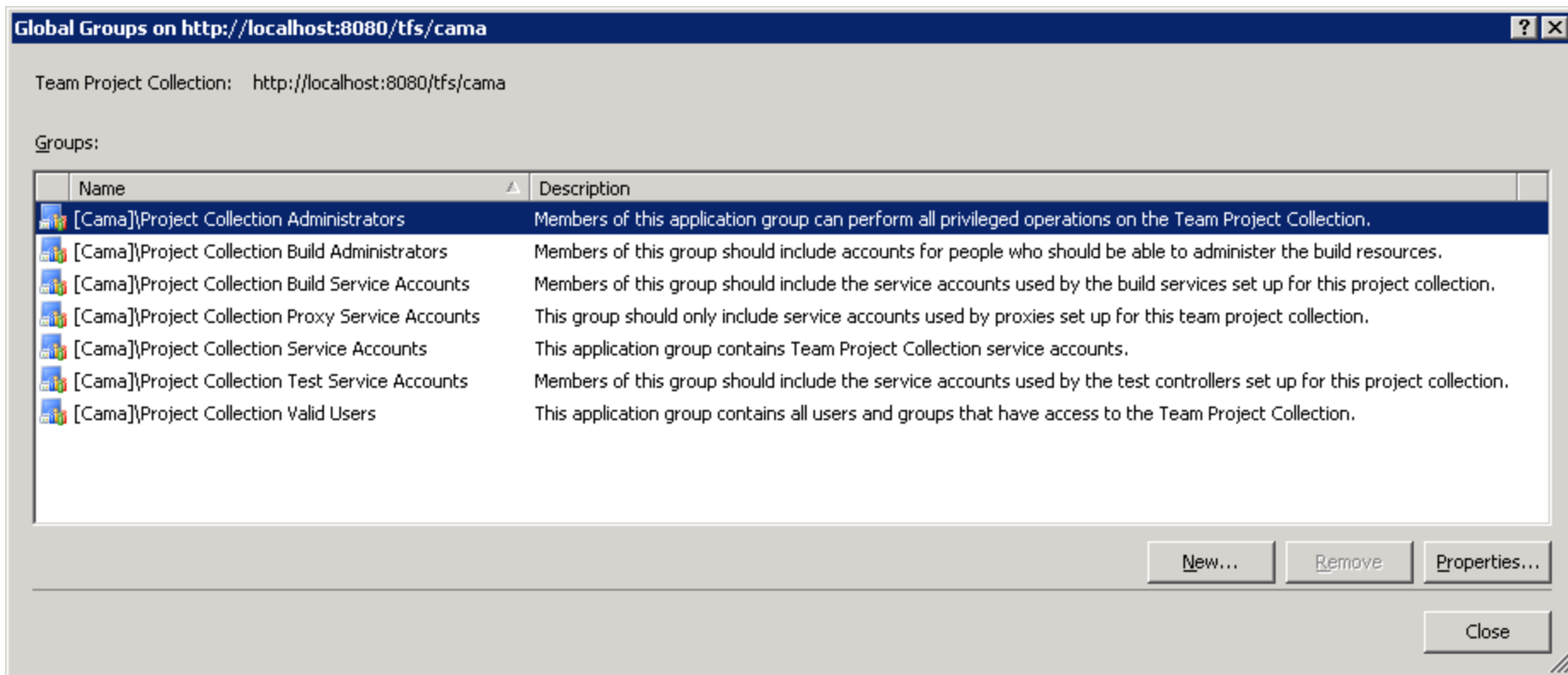
Name	State
CAMA	Online
RC	Online

Buttons for 'Create Collection' and 'Attach Collection' are visible on the right. Below this, the 'Team Projects' tab is selected, showing a table of projects:

Name	State	Description
CAMA_Production	Active	Repository for CAMA production cod...
CAMAPTA	Active	
RC Templates	Active	
RCWebServiceLibrary	Active	
SteveTest1	Active	Sandbox for Steve

A red bracket highlights the 'Name' column of the 'Team Projects' table.

Team Project Collection Security Groups



Team Project Collection Administration Security (Global)

General | Status | Team Projects

Cama
URL: <http://devk1tfs1:8080/tfs/Cama/>
SQL Server Instance: PROD1TSQL3\PRODSQL

- Stop Collection
- Edit Settings
- Group Membership
- Administer Security**
- Detach Collection

Global Security

Team Foundation Server: <http://localhost:8080/tfs>

Users and Groups:

Name	Description
[TEAM FOUNDATION]\SharePoint Web Application Services	This application group should only contain service accounts for SharePoint Web applications.
[TEAM FOUNDATION]\Team Foundation Administrators	Members of this group can perform all operations on the Team Foundation Application Instance.
[TEAM FOUNDATION]\Team Foundation Service Accounts	Members of this group have service-level permissions for the Team Foundation Application Instance. For service accounts on
[TEAM FOUNDATION]\Team Foundation Valid Users	Members of this group have access to the Team Foundation Application Instance.
[TEAM FOUNDATION]\Work Item Only View Users	Members of this group can only use the Work Item Only View feature in Web Access.
COUNTY\KorremulaB	IT DEPARTMENT- BUSINESS
COUNTY\MagalhaesC	IT DEPARTMENT- BUSINESS
NT AUTHORITY\IUSR	
NT AUTHORITY\NETWORK SERVICE	

Add users and groups

Team Foundation Server Group Windows User or Group

Permissions for [TEAM FOUNDATION]\Team Foundation Administrators:

Permission	Allow	Deny
Administer Warehouse	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Create team project collection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Delete team project collection	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Edit instance-level information	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Make requests on behalf of others	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Trigger events	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Use full Web Access features	<input checked="" type="checkbox"/>	<input type="checkbox"/>
View instance-level information	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Team Project Collection Database Repository

The screenshot shows a software interface with three tabs: 'General', 'Status', and 'Team Projects'. The 'Team Projects' tab is active. On the left, there is a tree view with a folder icon and the name 'Cama'. Below it, the following information is displayed:
URL: http://devkdfs1:8080/tfs/Cama/
SQL Server Instance: PRODITSQL3\PRODSQL

On the right side of the window, there is a vertical list of icons and labels:
- Stop Collection (red square with white 'X')
- Edit Settings (pencil icon) - A red arrow points to this icon.
- Group Membership (group of people icon)
- Administer Security (lock icon)
- Detach Collection (red square with white 'X')

Edit Team Project Collection Settings [X]

The Team Project Collection must be stopped before the connection information can be modified.

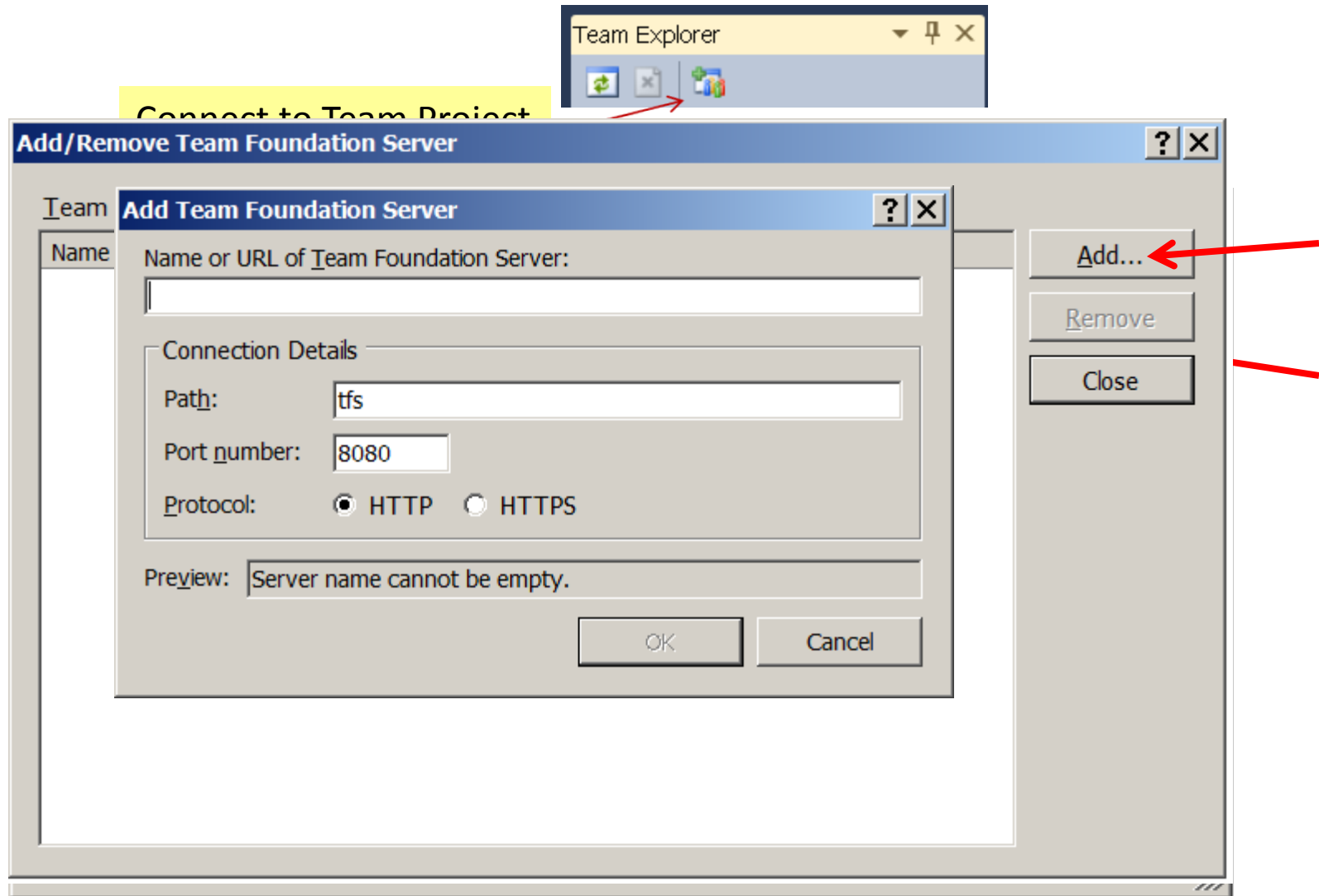
Name:

SQL Server Instance: [Test](#)

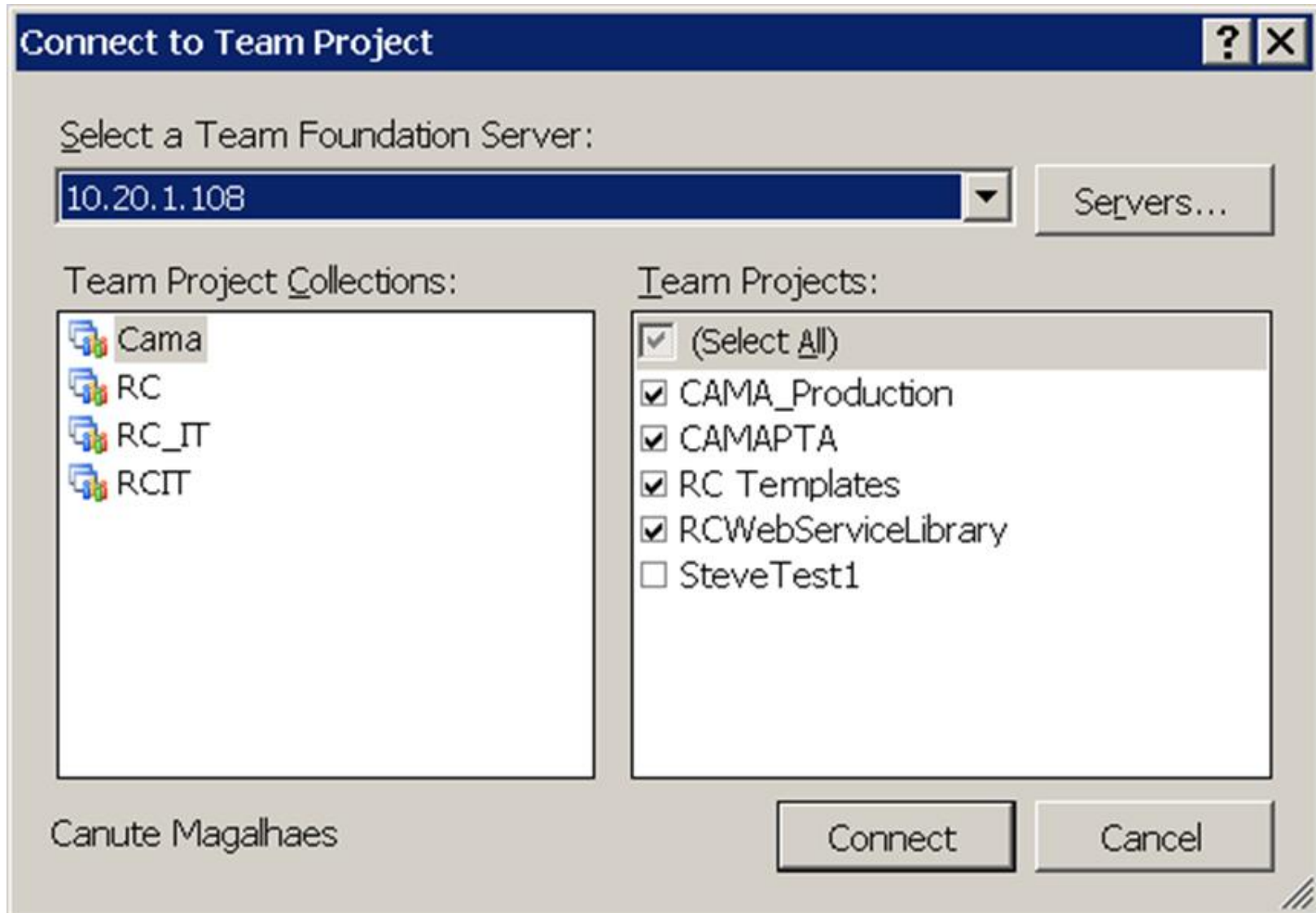
Database:

Description:

TFS thru Visual Studio using Team Explorer

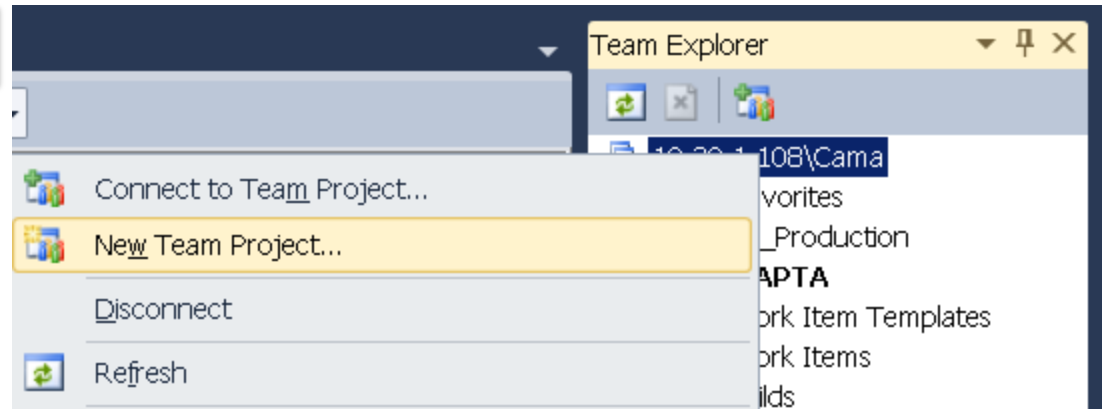


Collections and Projects on TFS



Adding Team Project To Collection

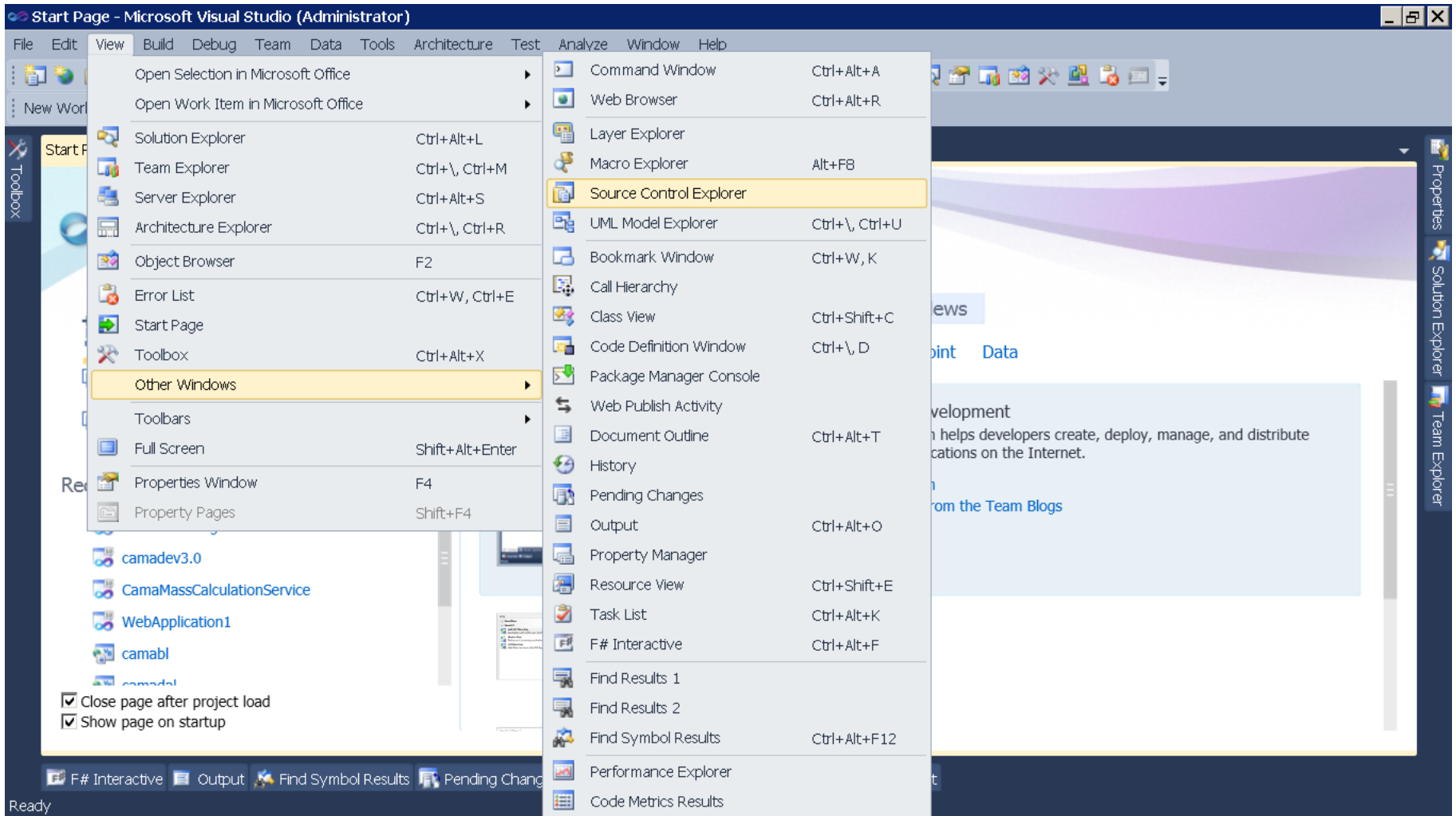
Using Visual Studio. Team Explorer



Using the command line (TFPT.exe)

```
TFPT CreatTeamproject
    /collection:uri
    /teamproject:"project name"
    /processtemplate:"template name"
    [/sourcecontrol:New | None | Branch:branchpath]
    [/log:"logfolder"]
    [/validate]
    [/verbose]
```

Version Control with TFS via (Visual Studio IDE)



Source Control Explorer

The screenshot shows the Source Control Explorer window in Microsoft Visual Studio. The window title is "Source Control Explorer - Microsoft Visual Studio (Administrator)". The menu bar includes File, Edit, View, Build, Debug, Team, Data, Tools, Architecture, Test, Analyze, Window, and Help. The toolbar contains various icons for file operations and source control. The "Workspace" is set to "5MKPKM1 (Local machine)". The "Source location" is "10.20.1.108\Cama". The "Local Path" is "Mapped".

The "Folders" pane on the left shows a tree view of the source control structure:

- 10.20.1.108\Cama
 - CAMA_Production
 - CAMAPTA
 - BuildLibraries
 - BuildProcessTemplates
 - Cama Sql Server Objects (Obsolete)
 - CamaDatabaseObjects
 - camadev3.0
 - CamaMassCalculationService
 - MiscFiles
 - SSIS Packages
 - TfsBuildManager
 - RC Templates
 - RCWebServiceLibrary
 - SteveTest1

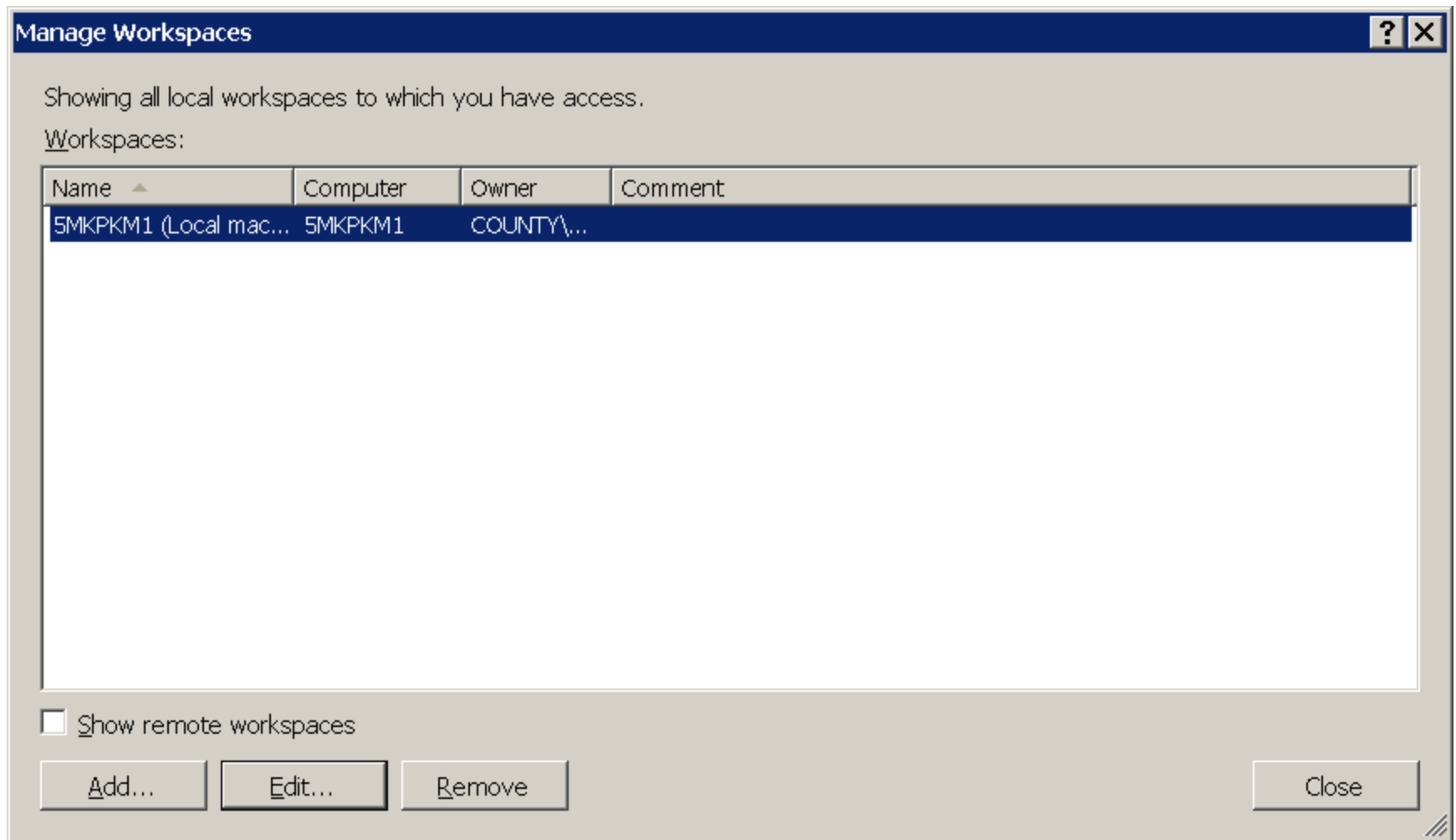
The main pane displays a table of files with their check-in history:

Name	Pending Ch...	User	Latest	Last Check-in
CAMA_Production			Yes	8/7/2013 3:...
CAMAPTA			Yes	8/25/2011 ...
RC Templates			Not ...	5/30/2012 ...
RCWebServiceLibrary			Yes	6/6/2012 3:...
SteveTest1			Not ...	5/23/2012 ...

A red arrow points from the "Name" column of the table to the "Local Path" field.

The status bar at the bottom shows "Ready" and several tool windows: F# Interactive, Output, Find Symbol Results, Pending Changes, Immediate Window, Find Results 1, and Error List.

Workspace



Configuring workspace

Edit Workspace 5MKPKM1 (Local machine) [?] [X]

Name:

Server:

Owner:

Computer:

Permissions: ▼
A private workspace can be used only by its owner.

Comment:

Working folders:

Status	Source Control Folder ▲	Local Folder
Active	\$/CAMA_Production	C:\Projects\CAMA Production
Active	\$/CAMAPTA	C:\Projects\CAMAPTA
Active	\$/RCWebServiceLibrary	C:\Projects\RCWebServiceLibrary
	Click here to enter a new working...	

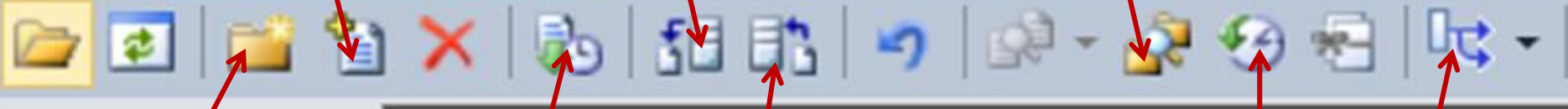
Buttons on Source Control Explorer

Add Items to Folder

Check Out

Compare Folders

Source Control Explorer X

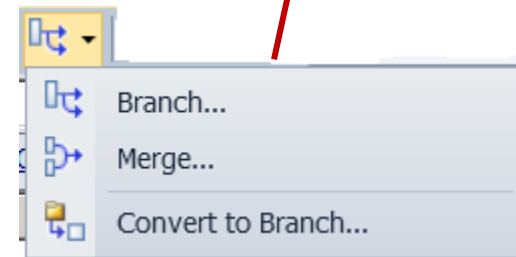


New Folder

Get Latest Version (Recursive)

Check In

History



Hierarchy & Relationship In Version Control

Whenever

a

document

or

documents

are checked-In

TFS generates a

Changeset number

Which uniquely identifies the file/s and its/their contents.

A

Label

is a collection of Changesets

More precisely, when a Label is created. The changeset number of the latest version, of each file in the **TFS Project**, at the time the label is being created, is taken and that collection of changesets, becomes the metadata of that Label.

Changesets (versions) of a file

The screenshot displays the 'History - commonbl.vb' window in Visual Studio. The source location is 'C:\Projects\CAMAPTA\camadev3.0\camabl\commonbl.vb'. The 'Changesets' tab is active, showing a table of version history. A red oval highlights the first six rows of the table. To the right, the 'Solution Explorer' shows the project structure for 'camadev3.0', with 'commonbl.vb' highlighted in a red oval.

Changeset	Change	User	Date	Path	Comment
2433	edit	COUNTY\MagalhaesC	11/26/2013 3:10:31 PM	\$/CAM...	Rolled back to Changeset 2370 as Assessed Value ne...
2432	edit	COUNTY\MagalhaesC	11/26/2013 12:16:26 PM	\$/CAM...	Issue 62: changed assessed value to accept bigger t...
2370	edit	COUNTY\GriffinG	9/26/2013 9:11:13 AM	\$/CAM...	Fix of rounding issues
2330	edit	COUNTY\MagalhaesC	8/15/2013 11:28:45 AM	\$/CAM...	Fix for issue 20 Part 1: If an override exists then the ...
2177	edit	COUNTY\MagalhaesC	4/25/2013 1:41:49 PM	\$/CAM...	Almost all Assessment and Valuation tab gripes are n...
2045	edit	COUNTY\MagalhaesC	12/21/2012 2:45:18 PM	\$/CAM...	Now runs the Calculation and saves the calculated val...
2020	edit	COUNTY\MagalhaesC	12/6/2012 1:17:20 PM	\$/CAM...	Populates the Improvement grid with all the improve...
1945	edit	COUNTY\MagalhaesC	10/15/2012 12:57:27 PM	\$/CAM...	First phase of Assessment override. The values are ...
1933	edit	COUNTY\MagalhaesC	9/28/2012 5:59:12 PM	\$/CAM...	Added function to get tax year from QDate.
1768	edit	COUNTY\MagalhaesC	7/2/2012 5:33:54 PM	\$/CAM...	Removed MH desc on Imp
1767	edit	COUNTY\MagalhaesC	7/2/2012 5:22:20 PM	\$/CAM...	Display more info on the user errors.
1766	edit	COUNTY\MagalhaesC	7/2/2012 2:37:39 PM	\$/CAM...	Giving more info for mobile home errors.
1751	edit	COUNTY\MagalhaesC	6/22/2012 3:04:29 PM	\$/CAM...	Provides more information on error.
1720	edit	COUNTY\MagalhaesC	6/14/2012 4:01:26 PM	\$/CAM...	Re-word "Effective date cannot come after end date ...
213	edit	COUNTY\MagalhaesC	12/2/2011 10:38:51 AM	\$/CAM...	Cap changes, first pass.
6	add	COUNTY\MagalhaesC	8/29/2011 10:07:42 AM	\$/CAM...	Initial Check-In.

Files in a Changeset

Changeset	Change	User	Date	Path	Comment
2409		COUNTY\M	10/22/2013 5:02:33 PM	\$/CAM...	Fix for Double dipping of Depreciation amount fro...
2384			13 2:39:38 PM	\$/CAM...	Removed another place where depreciation was b...
2333			13 1:46:58 PM	\$/CAM...	First pass of Mass Recalculation iteration 1, withou...
2313			3 2:06:19 PM	\$/CAM...	Fix for Defect 1 in QA - IMP Values are being reca...
2189			3 10:21:51 AM	\$/CAM...	First check in of Tms Stratification page.
2185			3 9:41:45 AM	\$/CAM...	Fix for calculating Manual improvements
2181			13 6:29:39 PM	\$/CAM...	Add the procedure to retrieve the last active time ...
2177			13 1:41:40 PM	\$/CAM...	Almost all Assessment and Valuation tab prices ar

- View
- Changeset Details...
- Compare...
- Annotate
- Track Changeset

Details for Changeset #2409 - Source Files

Source Files

Work Items

Check-in Notes

Comment:
Fix for Double dipping of Depreciation amount from Entity total

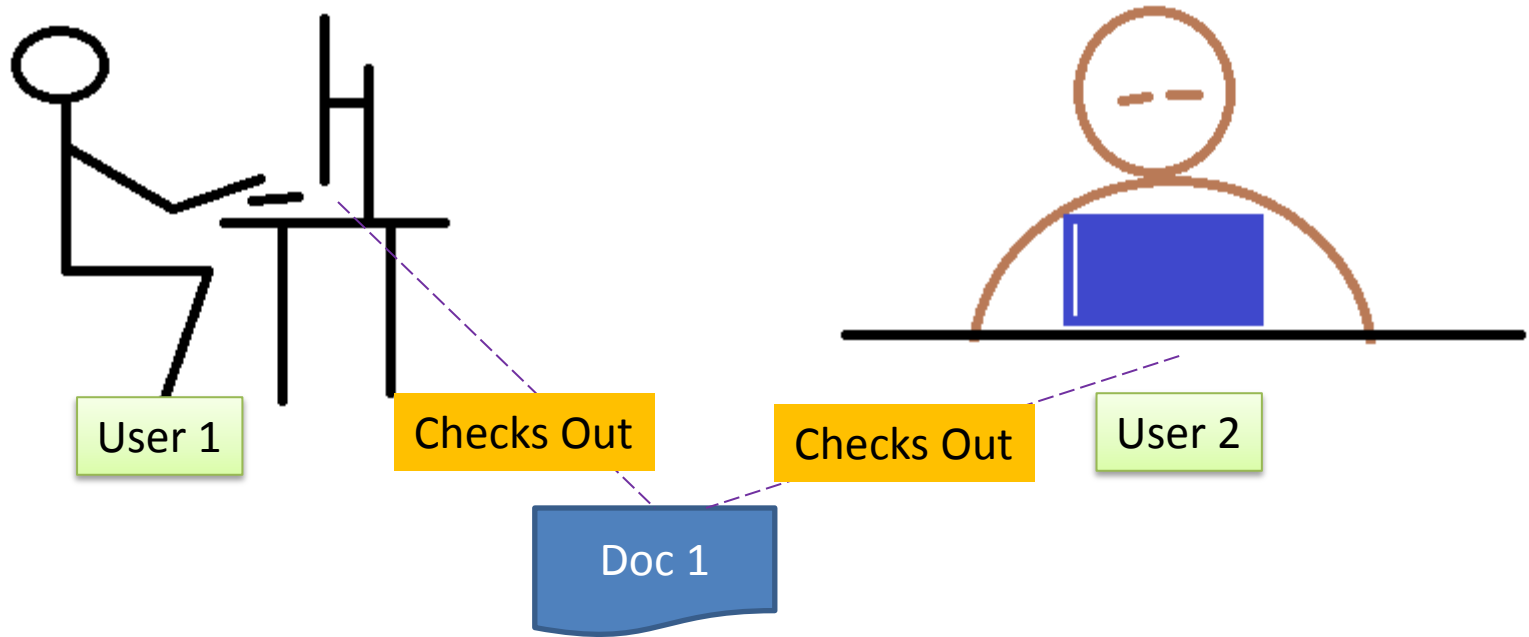
Name	Change	Folder
calculatedvaluesbl.vb	edit	\$/CAMAPTA/camadev3.0/camabl
improvbl.vb	edit	\$/CAMAPTA/camadev3.0/camabl
calculatems.vb	edit	\$/CAMAPTA/camadev3.0/camabl/classes

Changeset #: 2409 By User: COUNTY\MagalhaesC

Created On: 10/22/2013 5:02:33 PM

Save Cancel

Merge



User 1 changes **Doc 1**
and
Check-In

When user 2 changes **Doc 1**
and tries to
Check-In

Pending Changes conflicts

Pending Changes - Conflicts

AutoResolve All | Get All Conflicts | Refresh

Path Filter applied - 1 Total Conflicts: 10 Version

Name	Type	Path	Conflict Type	Description
visual B...		\\CAMAPTA\camadev5.0\cma\App_Code	Version	The item content has cha...

AutoMerge Merge Changes In Merge Tool Take Server Version Keep Local Version

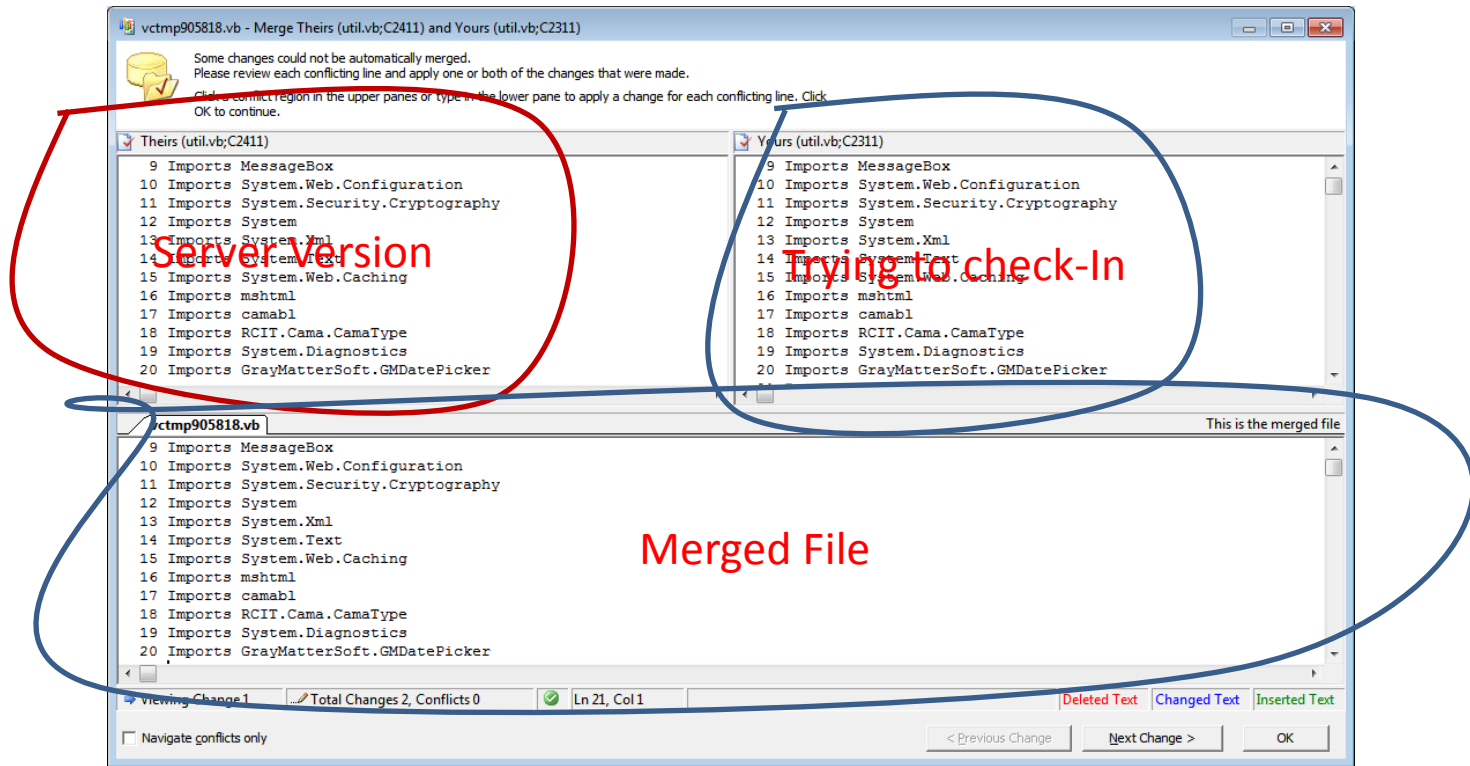
The item content has changed

Content Changes: There are non conflicting content changes in the local and the server versions

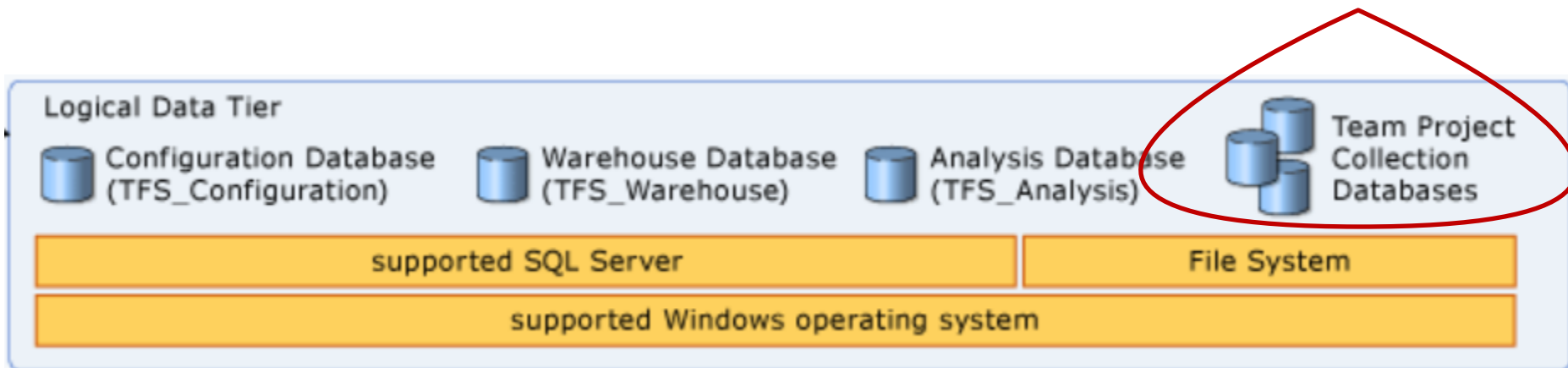
Your Local Version is: [2311](#) The Server Version is: [2411](#)

Server edits: [2411](#)

TFS Merge Tool



Where do project files reside in TFS



Object Explorer

Connect ▾



Server [redacted] (SQL Server 1

- [-] Databases
 - [+] System Databases
 - [+] Database Snapshots
 - [+] AuditorPT100
 - [+] DNN
 - [+] HelpdeskReset
 - [+] lansweeperdb
 - [+] NOVUS_Agenda
 - [+] OnBase
 - [+] PMD_prd
 - [+] pwddbba
 - [+] RCLibrary
 - [+] RCLogger
 - [+] RiskMgmt
 - [+] Tfs_Cama
 - [+] **Tfs_Configuration**
 - [+] Tfs_RC

Automating Builds with TFS

Build Controller

Build Agent

Build Definition

Workspace

XAML file (Build process template)

Build Controller

Each Build Controller is dedicated to a single Team Project Collection.

The Build Controller performs lightweight tasks, such as determining the name of the build, creating the label in version control, logging notes, and reporting status from the build.

The Build Controller distribute the processor-intensive work of your build process to its pool of build agents.

The Build Controller does not typically require significant processor time, in some cases you can host it on the same computer as your Team Foundation Server.

Build Agent

Each build agent is dedicated to and controlled by a single build controller.

Build agents can be hosted on the same build server that hosts their build controller

The build agent executes the steps of your build process that are contained in the AgentScope activity. Typically, these steps include getting files from version control, provisioning the workspace, compiling the code, running tests, and merging files back into version control.

AgentScope activity: *In the XAML file there is an Activity called "Run on Agent". You can add custom created activities to the "Run on Agent" activity. All activities in the "Run on Agent" are in the AgentScope.*

Configuring Build Controller and Agents

Team Foundation Server Administration Console

File Help

DEVITTF1

- Application Tier
 - Team Project Collections
 - SharePoint Web Applications
 - Reporting
 - Lab Management
- Proxy Server
- Team Foundation Backups
- Build Configuration**
- Logs

Build Configuration Refresh Help

Build Service configured for devittfs1\Cama

devittfs1 - Started on <http://devittfs1.county.rcgov.ads:9191/Build/v3.0/Services> as `_TFS_Service`
Build Service - [Restart](#) | [Stop](#) | [Properties](#) | [Unregister](#)

i Events: 1 informational in the last 24 hours

Each Build Controller manages a set of Build Agents. Each Build Agent must be assigned to a Build Controller, but the Controller does not have to be on the same host machine.

[New Agent...](#)

- Cama collection Controller** - Ready
Controller - [Properties](#) | [Delete](#) | [Disable](#) | [Restart](#)
- Cama collection - Agent1** - Ready
Agent for Cama collection Controller - [Properties](#) | [Delete](#) | [Disable](#) | [Restart](#)
- RCAgent1** - Ready
Agent for Cama collection Controller - [Properties](#) | [Delete](#) | [Disable](#) | [Restart](#)
- RCAgent2** - Ready
Agent for Cama collection Controller - [Properties](#) | [Delete](#) | [Disable](#) | [Restart](#)
- RCAgent3** - Ready
Agent for Cama collection Controller - [Properties](#) | [Delete](#) | [Disable](#) | [Restart](#)

Start | Server Manager | Team Foundation Ser

11/15/2014 10:04:02 AM

Properties of Build Controller

Build Controller Properties [?] [X]

Display Name:
Cama collection Controller

Description:

Computer Name:
devittfs1

Version control path to custom assemblies:
\$/CAMAPTA/BuildLibraries/RCITActivityLibrary ...

Maximum number of concurrently running builds

Default to number of agents

Specify the maximum:

Build Controller service is enabled

Build Controller status is Available

The controller status has been changed while testing connections at 1/10/2014 9:15:26 AM GMT.
Reason: Tested successfully.

Test Connection OK Cancel

Properties of Build Agent

Build Agent Properties [?] [X]

Display Name:

Description:

Controller:

Computer Name:

Working Directory:

Build Agent service is enabled

Build Agent status is Available

The agent status has been changed while testing connections at 1/10/2014 9:15:27 AM GMT.
Reason: Tested successfully.

Tags:

[Add new tag](#)

Cama collection - Agent1

RCAgent1

RCAgent2

RCAgent3

Recommendation By Microsoft On Setting Up Build Agents

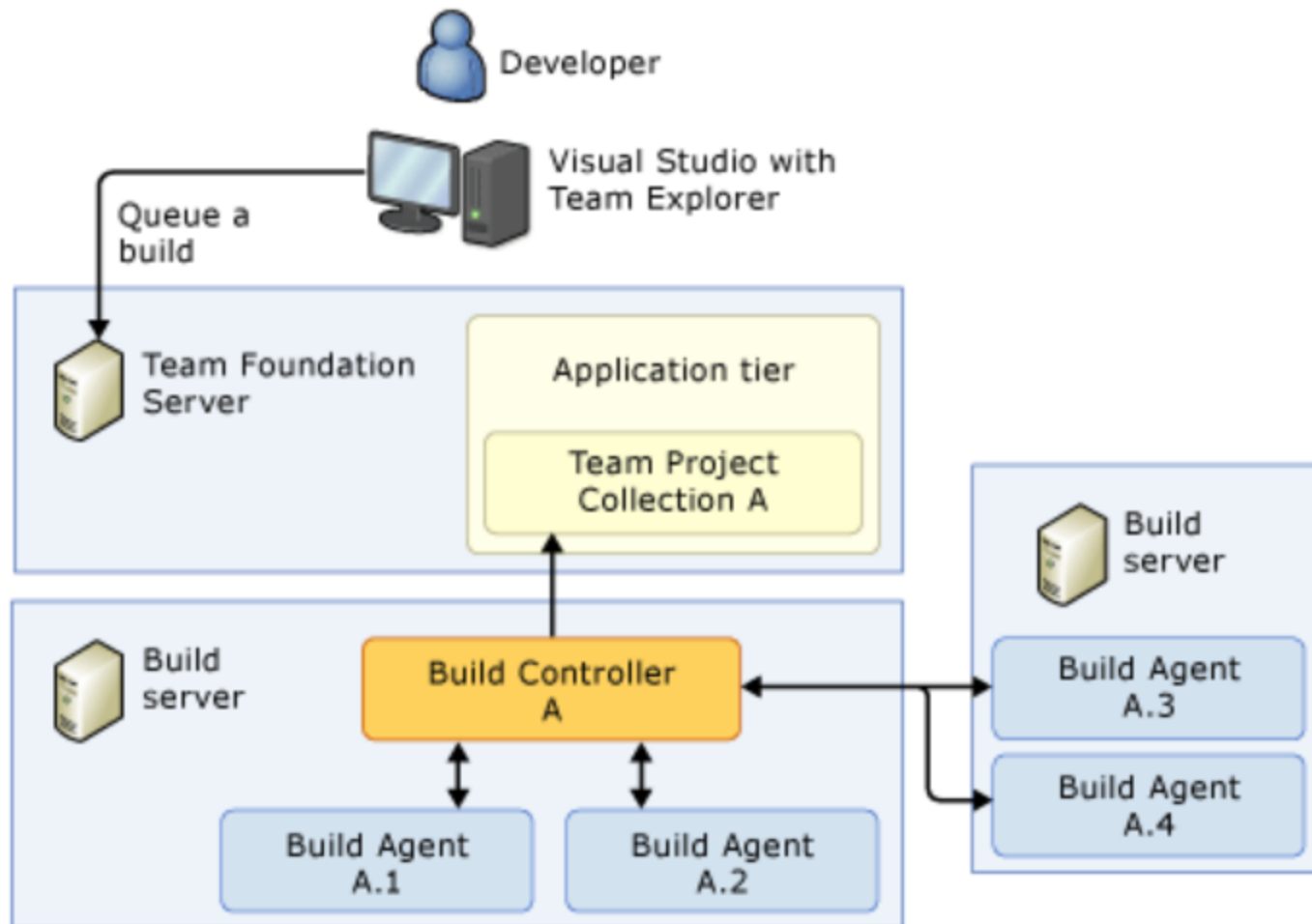
If you installed Team Foundation Build Service on the same server as Team Foundation Server or are using the hosted service, the default setting for Number of build agents to run on this build machine is 1 (recommended).

Choose Scale out build services to run concurrent builds across multiple machines. If you choose this option, you have to specify the number of build agents for this machine and then add them to a new or existing build controller.

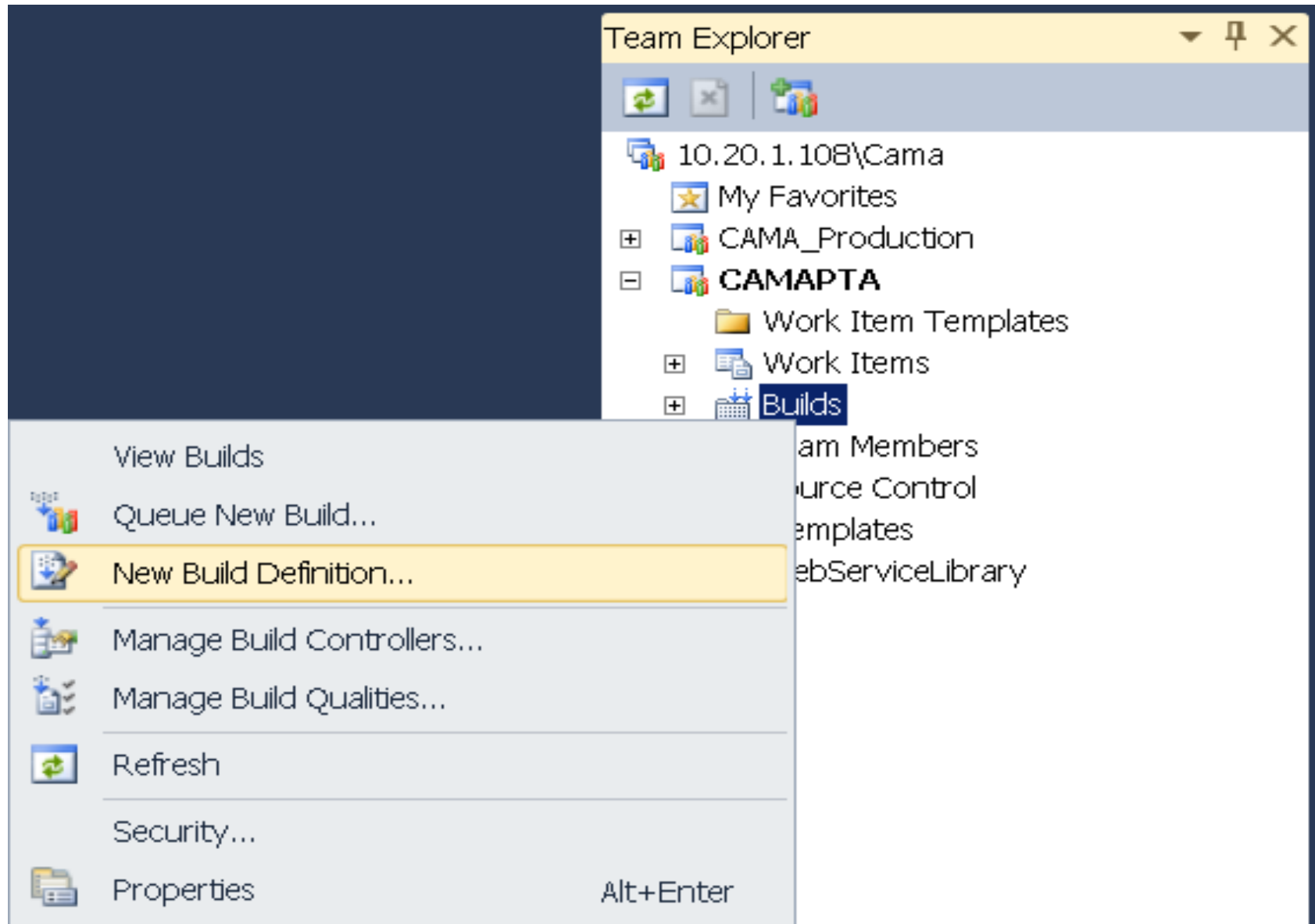
If you installed Team Foundation Build Service on its own server, the default setting for Number of build agents to run on this build machine is equal to the number of processor cores on this server.

Source: [http://msdn.microsoft.com/en-us/library/vstudio/ee259683\(v=vs.110\).aspx](http://msdn.microsoft.com/en-us/library/vstudio/ee259683(v=vs.110).aspx)

Build Server Configuration



Build Definition

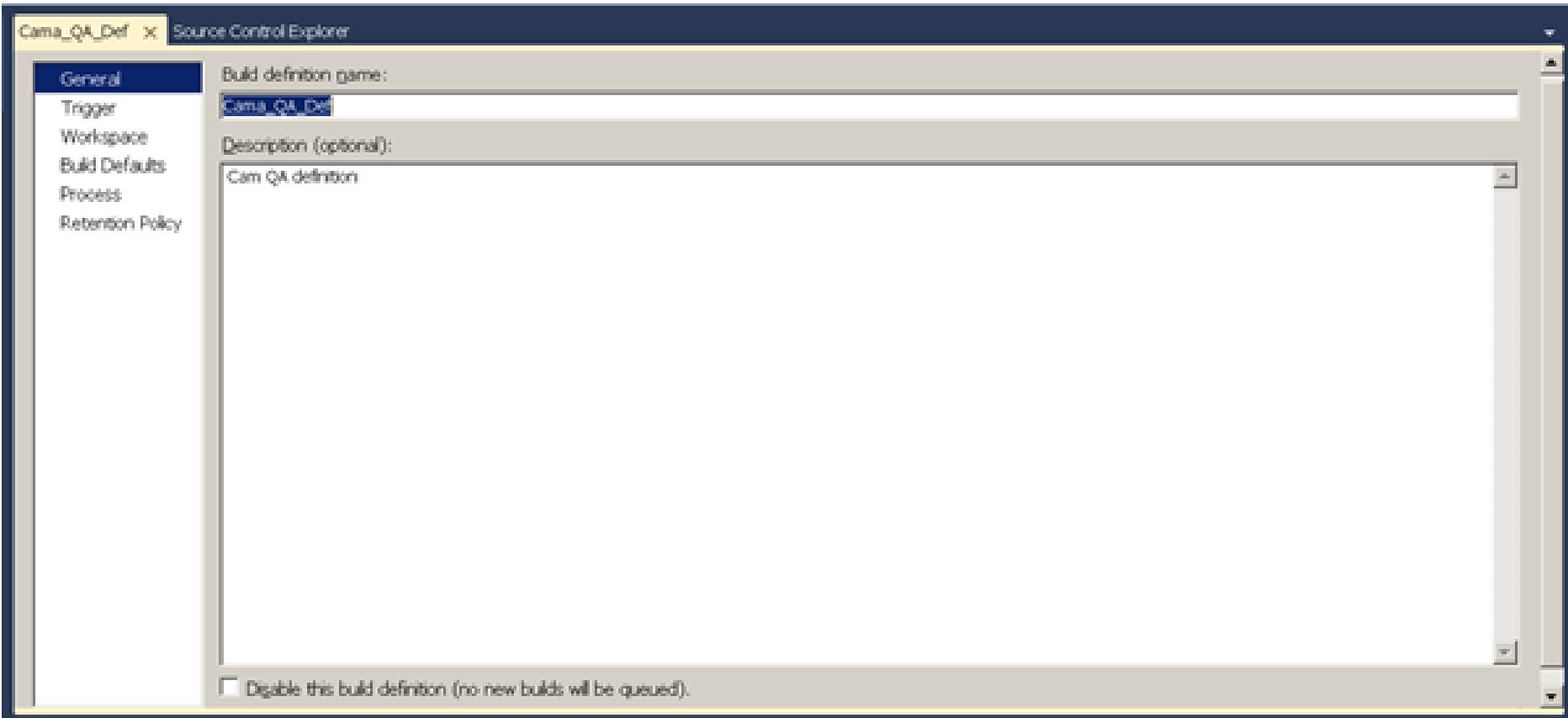


The image shows a screenshot of the Team Explorer window in a software development environment. The window title is "Team Explorer" and it displays a tree view of a project structure. The project is located at "10.20.1.108\Cama". The tree view includes "My Favorites", "CAMA_Production", and "CAMAPTA". Under "CAMAPTA", there are folders for "Work Item Templates", "Work Items", and "Builds". The "Builds" folder is selected, and a context menu is open over it. The menu items are:

- View Builds
- Queue New Build...
- New Build Definition...** (highlighted)
- Manage Build Controllers...
- Manage Build Qualities...
- Refresh
- Security...
- Properties (Alt+Enter)

Partially visible text to the right of the menu includes "Team Members", "Source Control", "Templates", and "WebServiceLibrary".

Creating a new Build Definition



Build Definition Trigger

Cama_QA_Def x Source Control Explorer

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
- Schedule - build every week on the following days
 Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Queue the build on the build controller at:
 Eastern Standard Time (GMT -05:00)

Build even if nothing has changed since the previous build.

Typically, for development builds

Build Definition Workspace

The screenshot shows the 'Workspace' tab of the 'Cama_QA_Def' build definition in Source Control Explorer. The left-hand navigation pane includes 'General', 'Trigger', 'Workspace' (selected), 'Build Definition', 'Process', and 'Retention Policy'. The main area is titled 'Working folders:' and contains a table with the following data:

Status	Source Control Folder	Build Agent Folder
Active	\$/CAMAPTA	\$(SourceDir)/CAMAPTA
	Click here to enter a new working...	

At the bottom of the window, there are two buttons: 'Copy Existing Workspace...' and 'Reset to Default Workspace'.

Build Definition Defaults

Cama_QA_Def x Source Control Explorer

General
Trigger
Workspace
Build Defaults
Process
Retention Policy

Specify the build controller and staging location for this build definition. These selections may be modified by the person queuing the build.

Build controller:
Cama collection Controller

Description:

This build does not copy output files to a drop folder

Copy build output to the following drop folder (UNC path, such as \\server\share):

Copy build output to the following Source Control folder:

Build Definition Process

Teams Foundation Build uses a build process template defined by a Windows Workflow (XAML) file. The behavior of this template can be customized by setting the build process parameters provided by the selected template.

Build process template: **CamaQaProcess.xaml** Hide details

Build process file (Windows Workflow XAML):
\$/CAMAPTA/CamaQaProcess.xaml New... Refresh

Version control path (click to open location in Source Control Explorer):
[\\$/CAMAPTA/BuildProcessTemplates/CamaQaProcess.xaml](#)

Build process parameters:

1. Required	
Items to Build	Build \$/CAMAPTA/camadev3.0/camadev3.0.sln with default platform and con
Configurations to Build	
Projects to Build	\$/CAMAPTA/camadev3.0/camadev3.0.sln
2. Basic	
Automated Tests	Run tests in assemblies matching **/*test*.dll
Build Number Format	
Clean Workspace	All
Locals Verbosity	Normal
3. Advanced	

Build Definition Process (Specify Build Agent)

The screenshot shows the 'Process' tab in the Build Definition editor for 'Cama_QA_Def'. The 'Build process template' is 'CamaQaProcess.xaml'. The 'Build process parameters' table is as follows:

Parameter	Value
Perform Code Analysis	AsConfigured
Source And Symbol Server Settings	Index Sources
3. Advanced	
Agent Settings	Use agent where Name=Cama collection - Agent1 and Tags match exactly Car
Maximum Agent Execution Time	00:00:00
Maximum Agent Reservation Wait Time	04:00:00
Name Filter	Cama collection - Agent1
Tag Comparison Operator	MatchExactly
Tags Filter	Cama collection - Agent1
Analyze Test Impact	True
Associate Changesets and Work Items	True
Copy Outputs to Drop Folder	True
Create Work Item on Failure	True
Disable Tests	False
Get Version	

Agent Settings
Specify the Name and/or Tags (and other properties) that will be used to select an appropriate Agent for the build.

Build Definition Process (Specify MSBuild Info)

Team Foundation Build uses a build process template defined by a Windows Workflow (XAML) file. The behavior of this template can be customized by setting the build process parameters provided by the selected template.

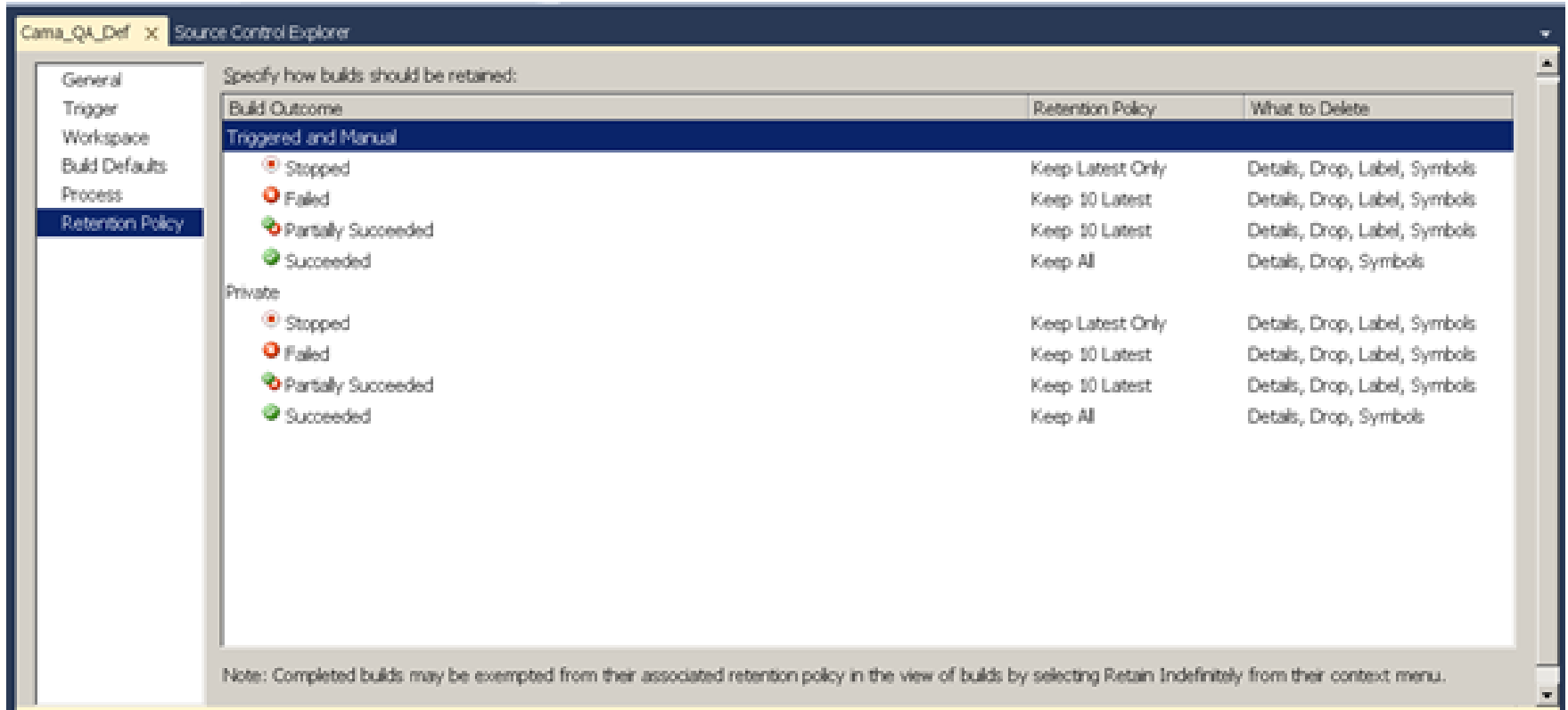
Build process template:
CamaQaProcess.xaml [Show details](#)

Build process parameters:









Perform Code Analysis	AsConfigured
Source And Symbol Server Settings	Index Sources
3. Advanced	
Agent Settings	
Analyze Test Impact	True
Associate Changesets and Work Items	True
Copy Outputs to Drop Folder	True
Create Work Item on Failure	True
Disable Tests	False
Get Version	
Label Sources	False
MSBuild Arguments	/p:Configuration=Release /t:rebuild
MSBuild Platform	X86
Private Drop Location	

Agent Settings
Specify the Name and/or Tags (and other properties) that will be used to select an appropriate Agent for the build.

Build Definition Retention Policy



Specify how builds should be retained:

Build Outcome	Retention Policy	What to Delete
Triggered and Manual		
 Stopped	Keep Latest Only	Details, Drop, Label, Symbols
 Failed	Keep 10 Latest	Details, Drop, Label, Symbols
 Partially Succeeded	Keep 10 Latest	Details, Drop, Label, Symbols
 Succeeded	Keep All	Details, Drop, Symbols
Private		
 Stopped	Keep Latest Only	Details, Drop, Label, Symbols
 Failed	Keep 10 Latest	Details, Drop, Label, Symbols
 Partially Succeeded	Keep 10 Latest	Details, Drop, Label, Symbols
 Succeeded	Keep All	Details, Drop, Symbols

Note: Completed builds may be exempted from their associated retention policy in the view of builds by selecting Retain Indefinitely from their context menu.

Build Definition Retention Policy (Delete policy)

Source Control Explorer

Specify how builds should be retained:

Build Outcome	Retention Policy	What to Delete
Triggered and Manual		
Stopped	Keep Latest Only	Details, Drop, Label, Symbols
Failed	Keep 10 Latest	Details, Drop, Label, Symbols
Partially Succeeded	Keep 10 Latest	Details, Drop, Label, Symbols
Succeeded	Keep All	Details, Drop, Symbols
Private		
Stopped	Keep Latest Only	Details, Drop, Label, Symbols
Failed	Keep 10 Latest	Details, Drop, Label, Symbols
Partially Succeeded	Keep 10 Latest	Details, Drop, Label, Symbols
Succeeded	Keep All	Details, Drop, Symbols

Note: Completed builds may be exempted from their associated retention policy in the view of builds by selecting Retain Indefinitely from their context menu.

Build Definition Retention Policy (Delete policy - Options)

Build Delete Options [?] [X]

Choose what will be deleted when builds of "Private" have a status of "Succeeded".

Details (always deleted by retention policies)
Information about the build stored in the Team Foundation Server database including build steps, requestor, date/time queued, etc.

Drop
File and folders output by the build and copied to the drop location.

Test Results
Results of any automated tests executed during the build process or results of any test published against this build.

Label
The version control marker associated with the specific file versions used by the build process.

Symbols
The debugging symbols published to a symbol server during the build.

OK Cancel

Manual Build Kick-Off

NewCamaDevDefinition x Cama_QA_Def BuildNumberGenerator.vb Source Control Explorer RCITActivityLibrary

General
Trigger
Workspace
Build Defaults
Process
Retention Policy

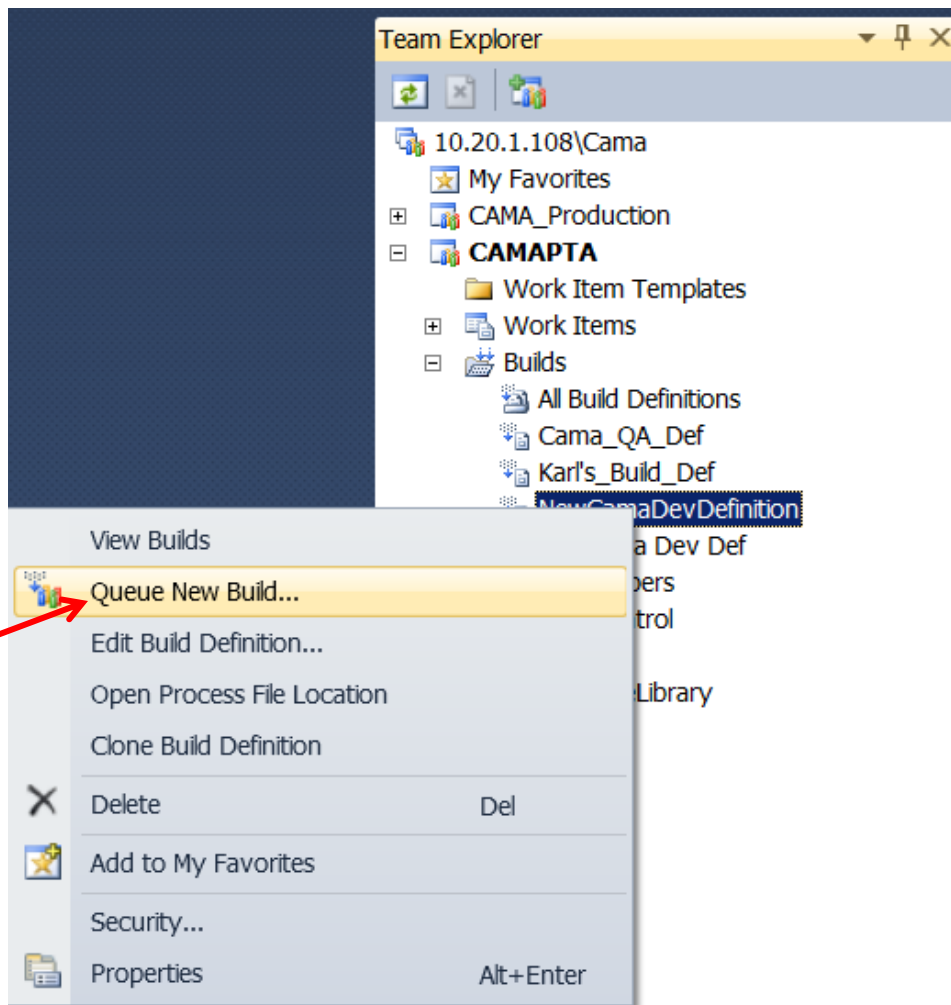
Team Foundation Build uses a build process template defined by a Windows Workflow (XAML) file. The behavior of this template can be customized by setting the build process parameters provided by the selected template.

Build process template: **CamaDEVProcessTemplate.xaml** Show details

Build process parameters:

1. Required	
Items to Build	Build \$/CAMAPTA/camadev3.0/camadev3.0.sln with
2. Basic	
3. Advanced	
Agent Settings	Use agent where Name=Cama collection - Agent1 and
Analyze Test Impact	True
Associate Changesets and Work Items	True
Copy Outputs to Drop Folder	True
Create Work Item on Failure	True
Disable Tests	False
Get Version	
Label Sources	True

Kick-Off Build



General Parameters

Build process parameters:

1. Basic

Clean Workspace	All
Logging Verbosity	Normal
Perform Code Analysis	AsConfigured
Source And Symbol Server Settings	Index Sources

2. Advanced

Agent Settings	Use agent where Name=Cama collection
Analyze Test Impact	True
Associate Changesets and Work	True
Copy Outputs to Drop Folder	True
Create Work Item on Failure	True
Disable Tests	False
Get Version	L + the Label number
Label Sources	False
MSBuild Arguments	/p:Configuration=Release /t:rebuild
Private Drop Location	

Get Version

Specify the version of files to get from source control. If set, this value...

Queue

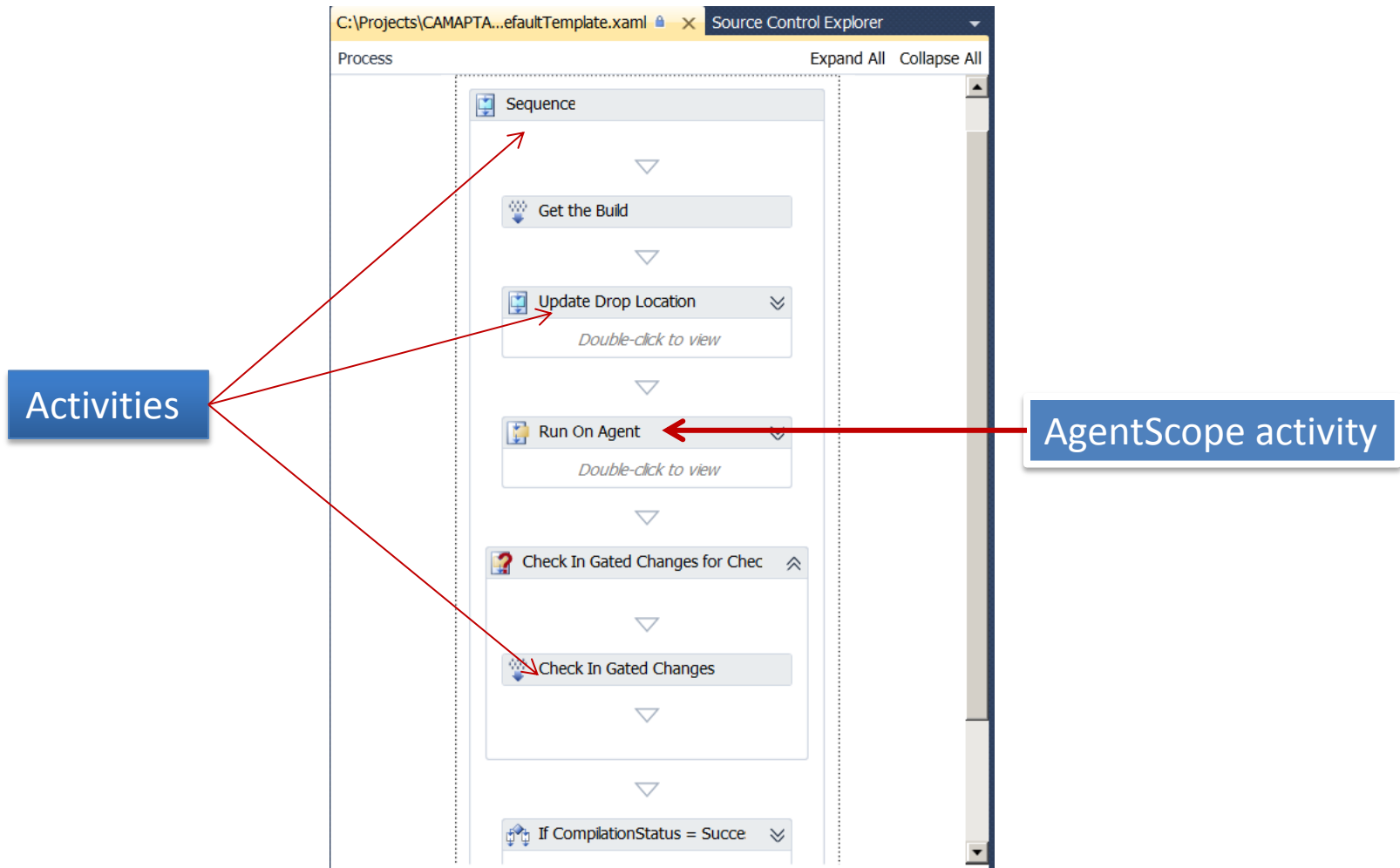
Cancel

The XAML (Workflow) file Templates

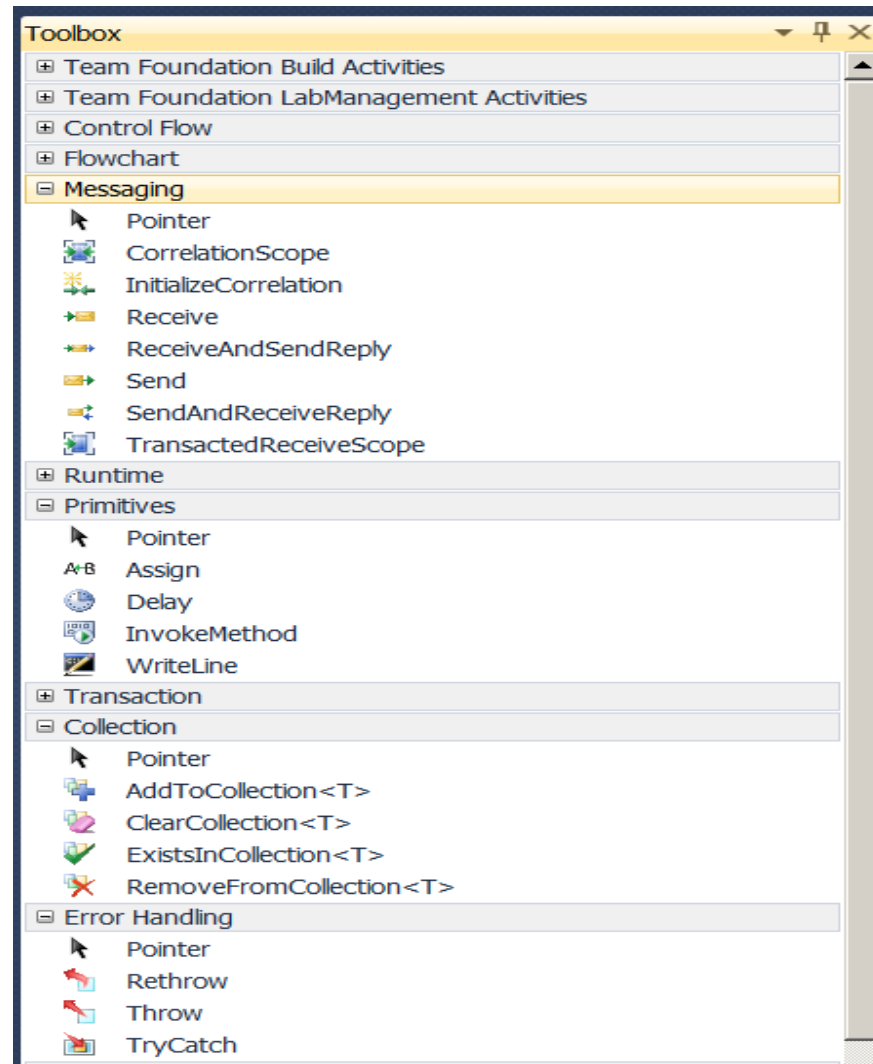
The screenshot shows the Source Control Explorer interface. The workspace is set to '5MKPKM1 (Local machine)'. The source location is '\$/CAMAPTA/BuildProcessTemplates'. The local path is 'C:\Projects\CAMAPTA\BuildProcessTemplates'. The 'Folders' pane on the left shows a tree view with 'BuildProcessTemplates' highlighted. The main pane displays a table of files with columns for Name, Pending Ch..., User, Latest, and Last Check-in. Two files, 'DefaultTemplate.xaml' and 'LabDefaultTemplate.xaml', are circled in red.

Name	Pending Ch...	User	Latest	Last Check-in
CamaDEvProcessTemplate.xaml			Yes	9/27/2012 ...
CamaQaProcess.xaml			No	9/3/2013 8:...
DefaultTemplate.xaml			Yes	6/15/2012 ...
LabDefaultTemplate.xaml			Yes	8/25/2011 ...

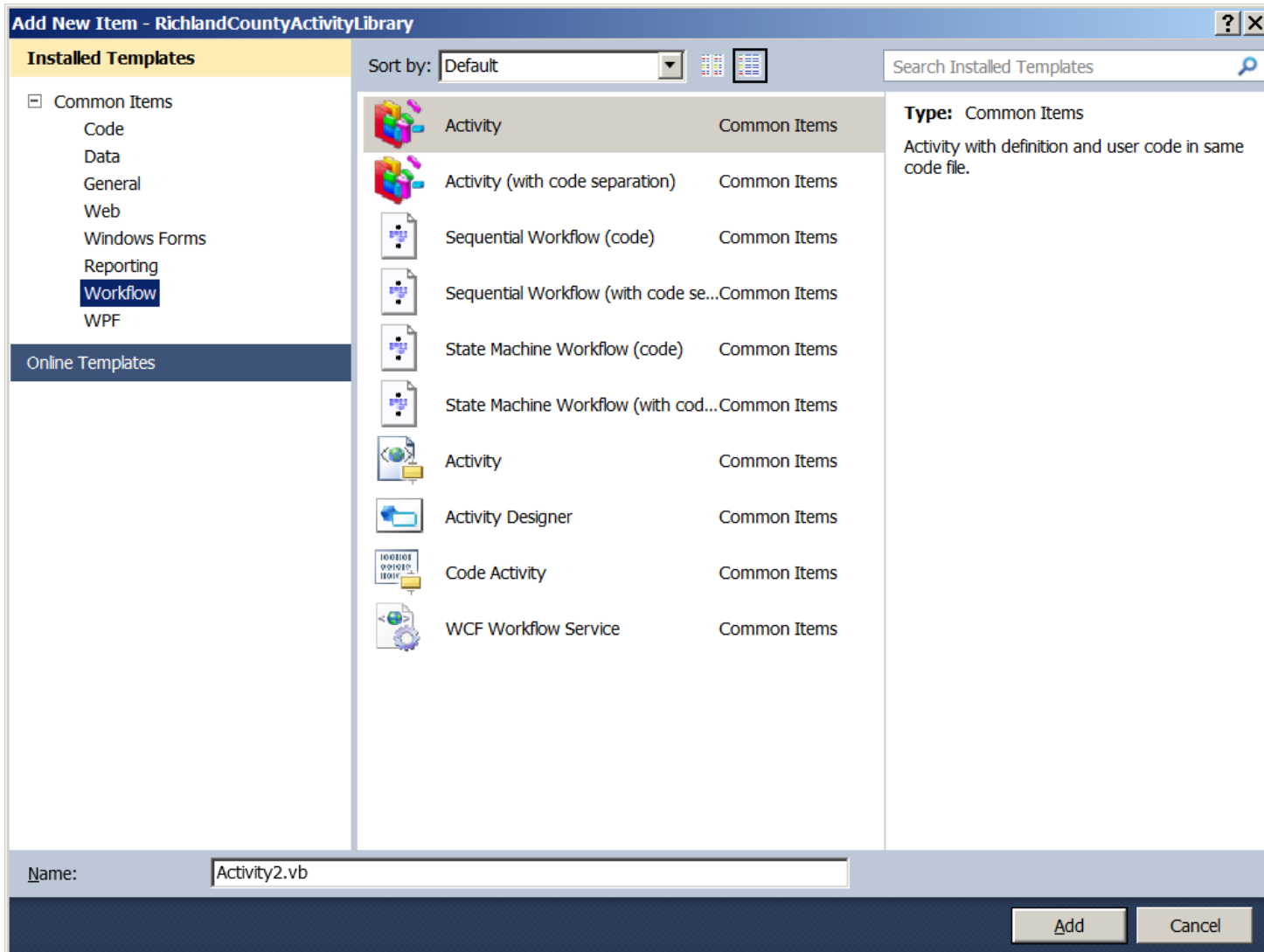
Build Process XAML (Workflow)



XAML (Workflow) Activity Toolbox



Create Custom Activity

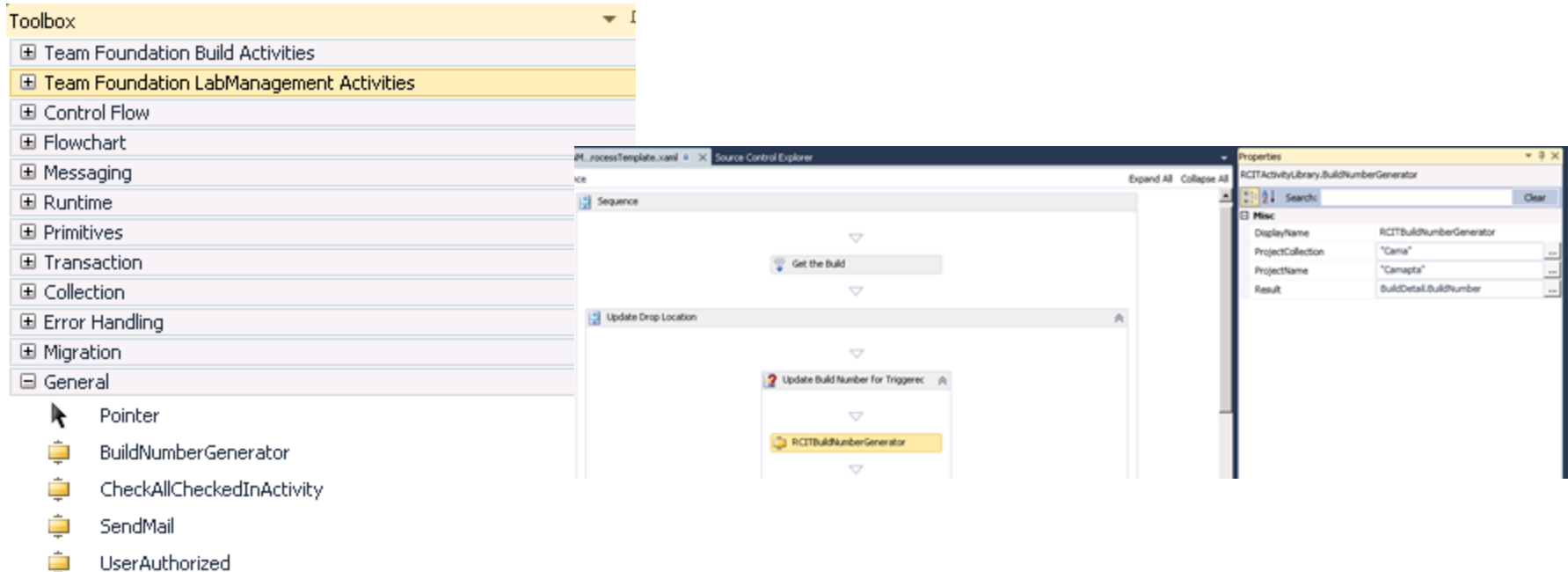


Adding Custom Activities to the XAML Toolbox

The DLL containing the custom activities needs to be registered in the GAC, using gacutil.exe, on the machine that the XAML will be executed.

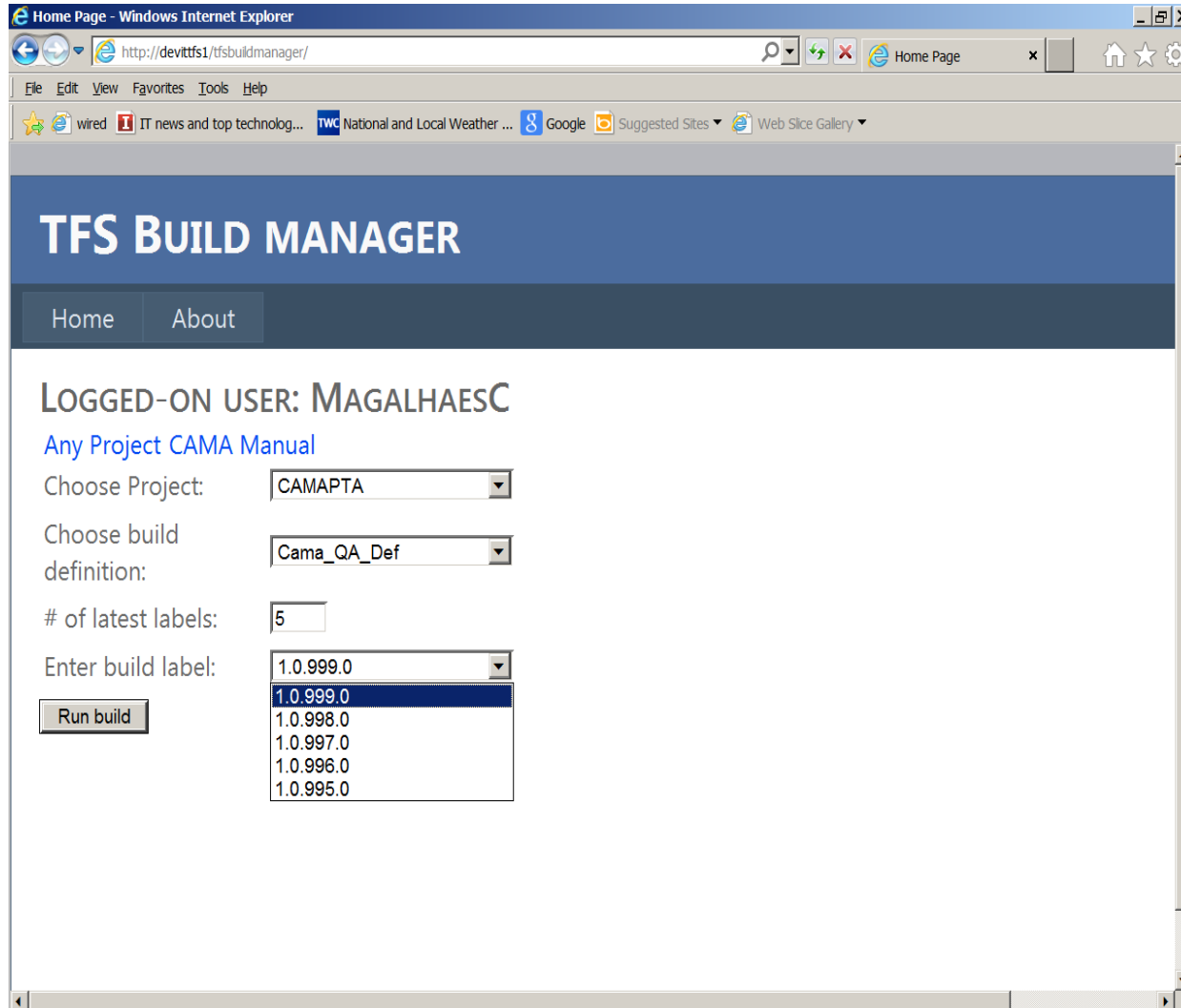
Right click on the Toolbox and click on “Choose Items...”

Add the custom activities DLL

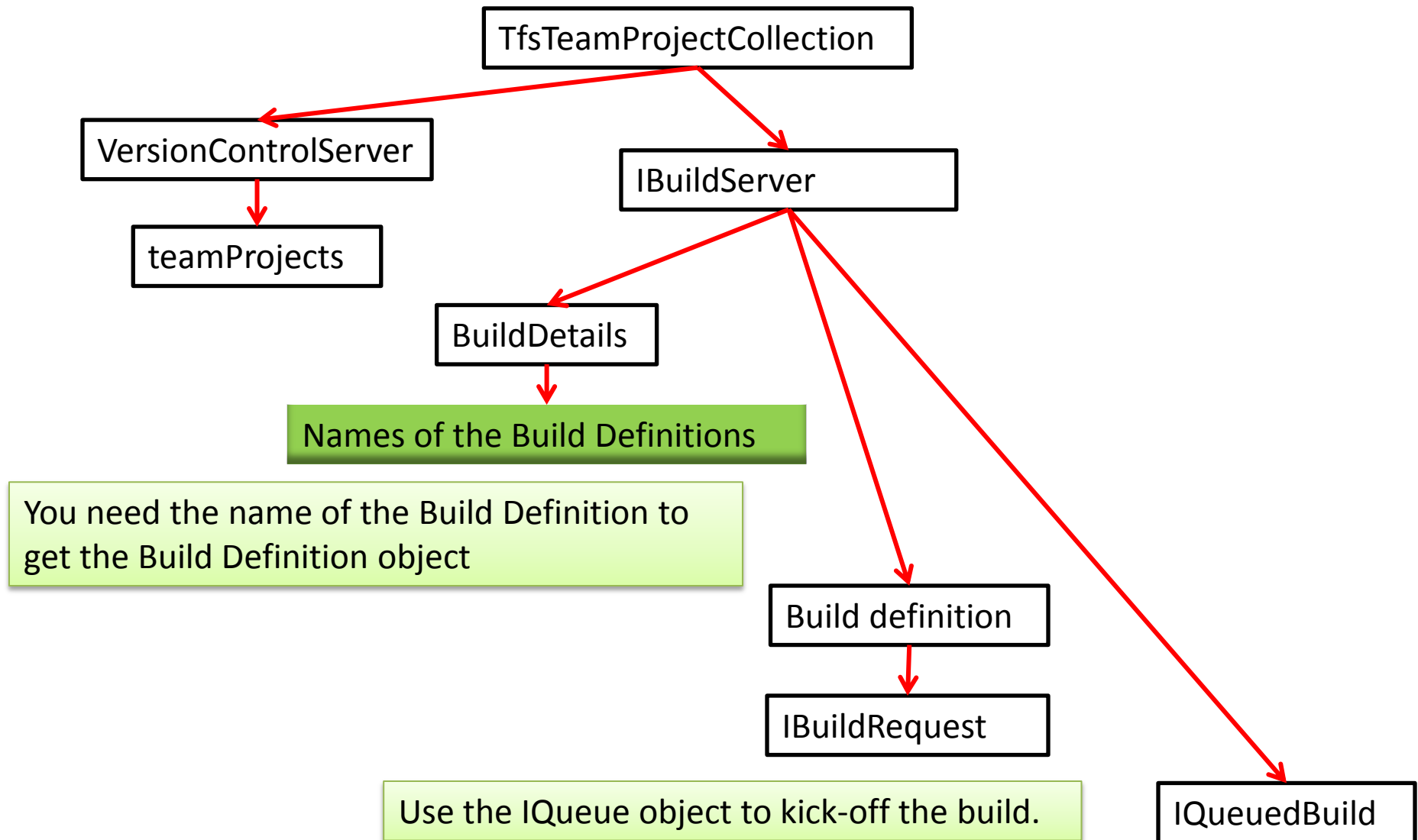


Programmatically Interfacing with TFS

Web Page used by Analyst to Kick-Off QA Build



TFS Objects to programmatically connect to TFS and do builds, etc.



Required Team Foundation references

```
Imports Microsoft.TeamFoundation.Build
Imports Microsoft.TeamFoundation.Build.Client
Imports Microsoft.TeamFoundation.Client
Imports Microsoft.TeamFoundation.VersionControl.Client
Imports Microsoft.TeamFoundation.Framework.Client
```

Code sample

```
Dim tfsProjCollection = TfsTeamProjectCollectionFactory.GetTeamProjectCollection(New
Uri("http://Devittfs1:8080/tfs/cama"), New UICredentialsProvider())
Dim tfsVersionControlServer = tfsProjCollection.GetService(Of VersionControlServer)()
Dim tfsBuildServer = tfsProjCollection.GetService(Of IBuildServer)()
Dim teamProjects = tfsVersionControlServer.GetAllTeamProjects(True)
Dim buildDetails = tfsBuildServer.QueryBuilds(Project Name)
Dim defNames = (From a In buildDetails
                Select a.BuildDefinition.Name).Distinct
Dim buildDef As IBuildDefinition =
tfsBuildServer.GetBuildDefinition(projectName,definitionName)
Dim buildRequest As IBuildRequest = buildDef.CreateBuildRequest
buildRequest.GetOption = GetOption.Custom
buildRequest.CustomGetVersion = "L" & label
'L' indicates to TFS that the text passed is a label.
buildRequest.RequestedFor = Request.LogonUserIdentity.Name
Dim queue As IQueuedBuild = TFSBuildServer.QueueBuild(buildRequest, QueueOptions.None)
queue.WaitForBuildStart()
```

Demo a triggered build

Questions ???

Thank You

Canute Magalhaes

Contact: MagalhaesC@rcgov.us