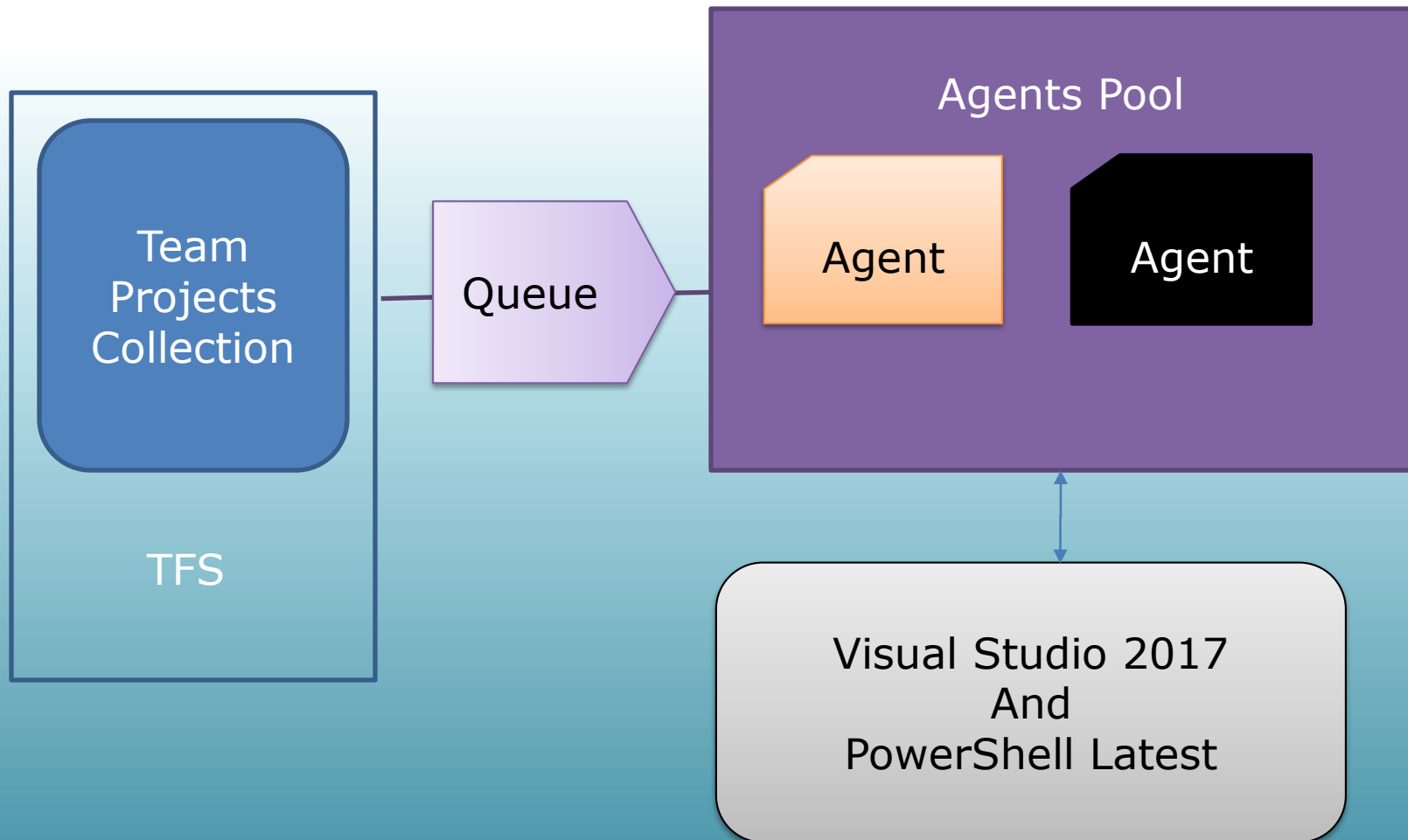


# Manage Build Service



# Build Service Architecture



# Agent Installation



# Agent Installation Parameters

- Run as Service
- Run as Interactive User
- */ServerUrl:ServerUrl*
- */Name:AgentName*
- */PoolName:PoolName*
- */WorkFolder:WorkFolder*
- */Force*
- */NoStart*
- */RunningAsService*
- */StartMode:(Automatic|Manual|Disabled)*

```
Administrator: Command Prompt

d:\agent>configureagent
Enter the name for this agent (default is Agent-SSGS-LT5)
Enter the URL for the Team Foundation Server (default is ) http://ssgs-lt5:8080/tfs
Configure this agent against which agent pool? (default pool name is 'default')

Enter the path of the work folder for this agent (default is 'd:\agent\_work')
Would you like to install the agent as a Windows Service (Y/N) (default is N) y
Enter the name of the user account to use for the service (default is NT AUTHORITY\LOCAL SERVICE) ssgs-lt5\subodhs
Enter the password for user account ssgs-lt5\subodhs:
Installing service vsoagent.ssgs-lt5.Agent-SSGS-LT5...
Service vsoagent.ssgs-lt5.Agent-SSGS-LT5 has been successfully installed.
Creating EventLog source vsoagent.ssgs-lt5.Agent-SSGS-LT5 in log Application...
Configuration successful.

d:\agent>
```

# Added Agent

Control panel > DefaultCollection


Overview

Security

Build


Agent queues

Extensions\*

New queue...     Download agent

Manage pools

▲ All Queues

▼  Default (Default)

Agents for pool Default

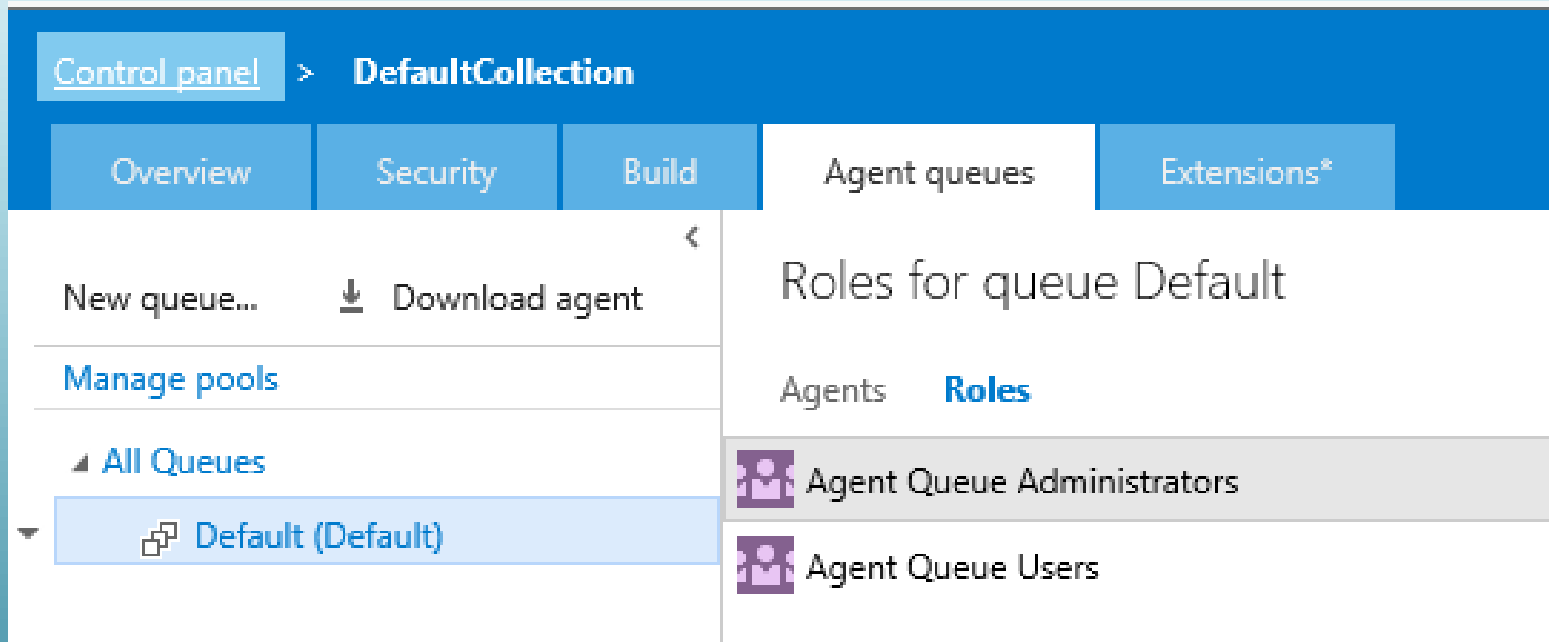
Agents

Roles

Enabled	Name	Current Status
<input checked="" type="checkbox"/>	Agent-SSGS-LT5	Idle

# Agent Pool Security

- Agent Pool Administrators
- Agent Pool Service Accounts



Control panel > DefaultCollection

Overview Security Build Agent queues Extensions\*

New queue... Download agent

Manage pools

All Queues

Default (Default)

Roles for queue Default

Agents Roles

Agent Queue Administrators

Agent Queue Users

# Agent Capabilities

Agent queues

Extensions\*

Agents for pool Default

Agents

Roles

Enabled	Name	Current Status
<input checked="" type="checkbox"/>	Agent-SSGS-LT5	Idle

Requests

Capabilities

USER CAPABILITIES

Shows information about user-defined capabilities supported by this host

+ Add capability

Save changes

Undo changes

SYSTEM CAPABILITIES

Shows information about the capabilities provided by this host

Agent.ComputerName	SSGS-LT5
Agent.Name	Agent-SSGS-LT5
Agent.OS	Windows_NT
Agent.OSVersion	10.0.10586
Agent.Version	1.95.0
AndroidSDK	D:\Program Files (x86)\Android\android-sdk
AndroidSDK_19	D:\Program Files (x86)\Android\android-sdk\platforms\android-19
AndroidSDK_21	D:\Program Files (x86)\Android\android-sdk\platforms\android-21
AndroidSDK_23	D:\Program Files (x86)\Android\android-sdk\platforms\android-23
asl.log	Destination=file
AzurePS	1.2.4



# Build Service Security

- Contributors group members have sufficient permissions to create, edit, queue and monitor build pipeline definitions
- Each project has a Build Administrators group who can administer permissions for build pipelines.
- Each Build pipeline has a security option to override permissions set by groups

# Lab 6A

- Build Agent Configuration

# Build Definition Creation

# Build Definition Creation


- Select a Template


Create new build definition


Select a template


Build


Deployment


**Universal Windows Platform**  
 Build Universal Windows Platform applications using Visual Studio. This template requires that Visual Studio and the Universal templates are


**Visual Studio**  
 Build and run tests using Visual Studio. This template requires that Visual Studio be installed on the build agent.


**Xamarin.Android**  
 Build an Android app and Xamarin.UITest assembly. Test with Xamarin Test Cloud.


**Xamarin.iOS**  
 Build a Xamarin.iOS app and Xamarin.UITest assembly. Test with Xamarin Test Cloud. This template requires a Mac OS build agent.


**Xcode**  
 Build and test an Xcode workspace. This template requires a Mac OS build agent.

**Empty**  
 Start with a definition that has no steps.

> Next

Cancel


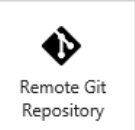

# Build Definition Creation

- Settings
  - Repository Source
  - Repository
  - CI
  - Queue


Create new build definition

**Settings**

Repository source



 TaskManagerl... Team Project	 Remote Git Repository	 Subversion
--	---	---

Repository

 \$/TaskManagerInfyMod1

☐ Continuous integration (build whenever this repository is updated)

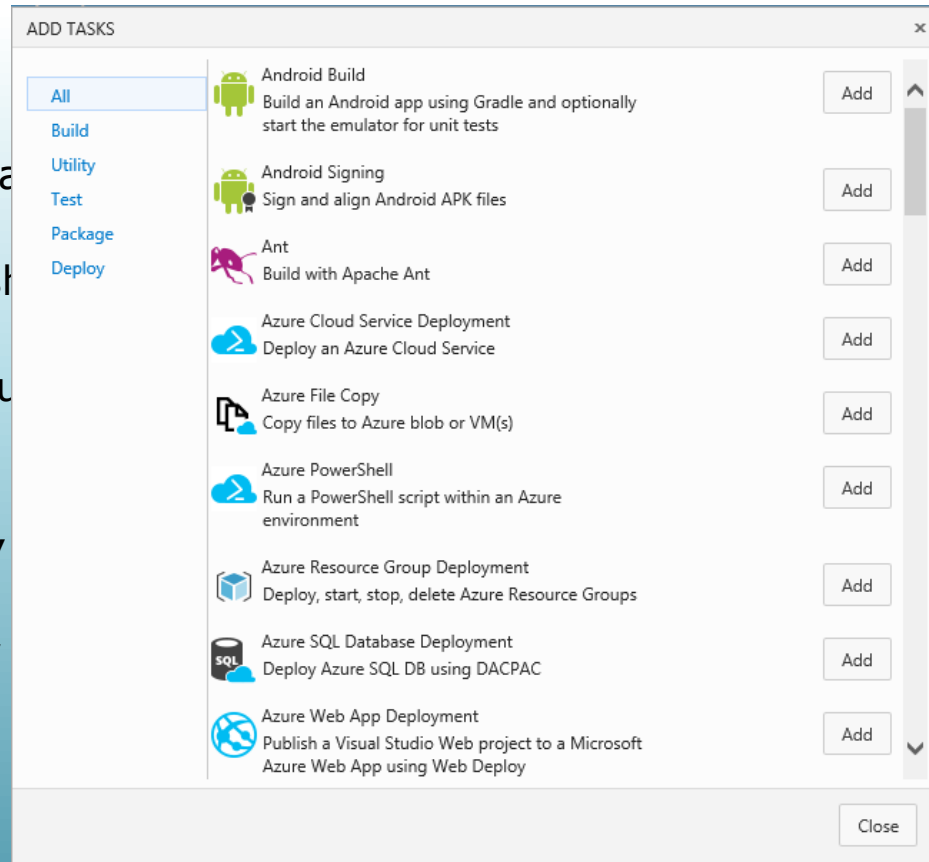
Default agent queue | [manage queues](#)

Default  

< Previous Create Cancel

# Build Definition Creation

- Build Steps
  - Build
    - Android, ant, maven
  - Utility
    - Copy and Publish
  - Test
    - VS Tests, Run Full Test
  - Package
    - NuGet (installer, ...)
  - Deploy
    - Azure File Copy, Machine



Cloud




Remote

# Build Definition Creation

- Options

Definitions / New Visual Studio definition 1

Build **Options** Repository Variables Triggers General Retention History

 Save  Queue build...  Delete

☒ **Multi-configuration**  
Build multiple configurations with the same steps

Multipliers

Parallel ☐


Continue on Error ☒

☒ **Create Work Item on Failure**  
Create a work item for each failed build

Type

Assign to requestor ☒

**Additional Fields**

 Add field

# Build Definition Creation

- Repository

Definitions / New Visual Studio definition 1

Build Options **Repository** Variables Triggers General Retention History

Save Queue build... Delete

Repository type Team Foundation Version Control

Repository name TaskManagerInfyMod1

Clean

Label sources On successful build

Label format \$(build.buildNumber)

**Mappings**

Type	Server Path	Local Path
X Map	\$/TaskManagerInfyMod1	\$(build.sourcesDirectory)\
X Cloak	\$/TaskManagerInfyMod1/Drops	

+ Add mapping



# Build Definition Creation

- Variables

Definitions / New Visual Studio definition 1

Build Options Repository **Variables** Triggers General Retention History

Save Queue build... Delete

List of predefined variables

Name	Value	Allow at Queue Time
system.collectionId	d862cf3c-941e-4b7f-b289-f6597b6c2cae	<input type="checkbox"/>
system.teamProject	TaskManagerInfyMod1	<input type="checkbox"/>
system.definitionId	<no definition id yet>	<input type="checkbox"/>
✕ system.debug	false	<input checked="" type="checkbox"/>
✕ BuildConfiguration	release	<input checked="" type="checkbox"/>
✕ BuildPlatform	any cpu	<input checked="" type="checkbox"/>
✕ Password	••••••••	<input type="checkbox"/>




+ Add variable

# Build Definition Creation

- Triggers

Definitions / New Visual Studio definition 1

Build Options Repository Variables **Triggers** General Retention History

 Save  Queue build...  Delete

☐ **Continuous integration (CI)**  
*Build each check-in.*

☐ **Scheduled**  
*Build at these times.*




☐ **Gated Check-in**  
*Accept check-ins only if the submitted changes merge and build successfully*



# Build Definition Creation



- General
- Demands

Definitions / New Visual Studio definition 1

Build Options Repository Variables Triggers **General** Retention History


 Save
  Queue build...
  Delete


Default agent queue    [Manage](#)

Build job authorization scope   

Description


Build number format

Build job timeout in minutes  

Badge enabled ☐ 

**Demands**

Name	Type	Value
msbuild	exists	
visualstudio	exists	
vstest	exists	




 [Add demand](#)


# Build Definition Creation


- Retention


Definitions / New Visual Studio definition 1


Build Options Repository Variables Triggers General **Retention** History

 Save  Queue build...  Delete

 Add new rule...

Days to keep:   
Minimum to keep:  

Delete build record: ☒  
Delete source label: ☒  
Delete test results: ☒ 

 Days to keep: 30  
Minimum to keep: 10

Delete build record: true  
Delete source label: true  
Delete test results: true

[Edit maximum build retention policy...](#)  
[Edit maximum test retention policy...](#)

# Best Practices

- Create a separate build for each scope
- Create build for the purpose e.g. Continuous Integration / Gated Check-in / For release
- Adjust scope in line with the purpose of the build – CI build scope should be small whereas build for Release should have entire solution in the build.
- Automate build triggers as per the need only.
- Use build variables that are built in to provide location transparency.
- Use Password chars in build variables wherever necessary
- While using hosted build agent use Server type artifact only

# Build Steps

Tasks

# Step Group – Build – Visual Studio Build

Definitions / DemoBuildDef | [Builds](#)

**Build** Options Repository Variables Triggers General Retention History

Save Queue build... Undo

+ Add build step...

- NuGet Installer  
NuGet restore **\*\*\\*.sln**
- Visual Studio Build**  
Build solution **\*\*\\*.sln**
- Visual Studio Test  
Test Assemblies **\*\*\\$(BuildConfiguration)\\*test\*.dll;-.\*\*\obj\\*\***
- Index Sources & Publish Symbols  
Publish symbols path:
- Copy Files  
Copy Files to: **\$(build.artifactstagingdirectory)**
- Publish Build Artifacts  
Publish Artifact: **drop**

**Build solution **\*\*\\*.sln****

Solution **\*\*\\*.sln**

MSBuild Arguments

Platform **\$(BuildPlatform)**

Configuration **\$(BuildConfiguration)**

Clean ☐

Restore NuGet Packages ☐

Visual Studio Version **Visual Studio 2015**

**Advanced**

MSBuild Architecture **MSBuild x86**

Record Project Details ☒

**Control Options**

Enabled ☒

Continue on error ☐

Always run ☐

# Step Group – Build – ant

**Ant**

**Ant build file \***  
Options  
Target(s)

**JUnit Test Results**  
Publish to VSO/TFS  
Test Results Files  
Test Run Title

**Code Coverage**  
Code Coverage Tool

**Advanced**  
Set ANT\_HOME Path  
Set JAVA\_HOME by  
JDK Version

Has to be under source control

If Set, Overrides environment variable



# Step Group – Build – Maven

**Maven**

Maven POM file \*

Options

Goal(s)

package

**JUnit Test Results**

Publish to VSO/TFS

Test Results Files

Test Run Title

**Code Coverage**

CodeCoverage Tool

None

**Advanced**


**SonarQube Analysis**





Run SonarQube Analysis

Has to be under source control



JaCoCo or Cobertura

# Step Group – Build – msbuild

**Build solution \*\*\\*.sln** 

Project	**\*.sln	
Platform		
Configuration		
MSBuild Arguments		
Clean	<input type="checkbox"/>	
Restore NuGet Packages	<input checked="" type="checkbox"/>	

**Advanced**

Record Project Details	<input type="checkbox"/>
MSBuild	<input checked="" type="radio"/> Version <input type="radio"/> Specify Location
MSBuild Version	MSBuild 14.0 
MSBuild Architecture	MSBuild x86 

**Control Options**

Enabled	<input checked="" type="checkbox"/>
Continue on error	<input type="checkbox"/>

Has to be under source control

It can be .sln file or .proj file containing msbuild script having minimum one target

# Step Group – Test – VS Test

**Execution Options**

Test Assembly

\*\*\\$(BuildConfiguration)\\*test\*.dll;-:\*\*\obj\\*\*

Test Filter criteria

Run Settings File

Override TestRun Parameters

Code Coverage Enabled
☐

Run In Parallel
☐

**Advanced Execution Options**

VSTest version

Visual Studio 2015

Path to Custom Test Adapters

Other console options

**Reporting Options**

Test Run Title

Platform

\$(BuildPlatform)

Configuration


\$(BuildConfiguration)

Any assy in soln containing test in name



Filter criteria like category

Custom Run Settings File


# Step Group – Test – Install Agents

**Deploy TestAgent on** 


▲ **Test Machine Group \***


Test Machine Group / Azure Resource Group \*   [Manage](#) 


Select Machines By ☒ Machine Names ☐ Tags

Filter Criteria  

▲ **Agent Configuration**

Username \*  

Password \*  

Interactive Process ☐ 

▶ **Advanced**

▲ **Control Options**


Enabled ☒

Continue on error ☐



Part of a standard environment


Install WinRM on Target Machines as prerequisite where Test Agent is to be deployed

# Step Group – Test – Functional Test


**Run Tests `**\*test*.dll` on** 


**Setup Options \***


Test Machine Group / Azure Resource Group \*   [Manage](#) 



Test Drop Location \*  


**Execution Options**


Test Selection  

Test Assembly  

Test Filter criteria  

Run Settings File   

Override Test Run Parameters  

Code Coverage Enabled ☐ 

**Reporting Options**

Part of a standard environment

Any automated functional test can be executed: Unit Test, Coded UI Test, Selenium Test etc.

# Step Group – Utilities – Batch Script

**Run script**

**Path \***

...

i

**Arguments**

i

**Modify Environment**
☐

i

**Advanced**

**Working folder**

...

i

**Fail on Standard Error**
☐

i

**Control Options**


**Enabled**
☒

**Continue on error**
☐

**Always run**
☐

Has to be under source control

# Step Group – Utilities – Copy Publish Artifact

**Copy Publish Artifact:** 

Copy Root

Contents \*

Artifact Name \*

Artifact Type **File share**

Path `\\my\share\$(Build.DefinitionName)\$(Build.BuildNumber)`

---

**Control Options**

Enabled ☒


Continue on error ☐



Always run ☐


Has to be under source control

Files or Folders



# Step Group – Utilities – PowerShell Script

**Powershell:** 

Script filename \*   

Arguments  

**Advanced**

Working folder   

**Control Options**

Enabled ☒

Continue on error ☐

Always run ☐

Has to be under source control



# Step Group – Utilities – bash script

**Shell Script**

Script Path \*
 
 ...
 ⓘ

Arguments
 
 ⓘ

▶ **Advanced**

▲ **Control Options**

Enabled ☒

Continue on error ☐

Always run ☐

Has to be under source control

# Step Group – Packaging – NuGet

**NuGet Packager**

Path/Pattern to nuspec files
...
i

Use Build number to version package
☐
i

Package Folder
...
i

**Advanced**

Configuration to Package
i

Additional build properties
i

NuGet Arguments
i

Path to NuGet.exe
i

**Control Options**

Enabled
☒

Continue on error
☐

Always run
☐

.nuspec or  
.csproj file

# Step Group – Packaging – npm

**npm install**

Command

**Advanced**

Arguments

Working Directory

**Control Options**

Enabled	<input checked="" type="checkbox"/>
Continue on error	<input type="checkbox"/>
Always run	<input type="checkbox"/>

# Step Group – Deploy – File Copy

**Copy files**

Source \*

...

i

Machines

↑

↓

i

Admin Login

i

Password

i

Destination Folder \*

i

**Advanced Options**

Clean Target

☐

i

Copy Files in Parallel

☒

i

Additional Arguments

↑

↓

i

Select Machines By

☒ Machine Names ☐ Tags

Filter Criteria


i

**Control Options**

Has to be under source control

FQDN or IP Address

# Step Group – Deploy – PowerShell on Remote Machine

**Run PowerShell on** 

**Machines \***

Admin Login

Password

Protocol ☐ HTTP ☐ HTTPS

**Deployment \***

**PowerShell Script \***

Script Arguments

Initialization Script

Session Variables

**Advanced Options**

Run PowerShell in Parallel ☒

Select Machines By ☒ Machine Names ☐ Tags

FQDN or IP  
Address

Required for  
WinRM

Has to be under  
source control

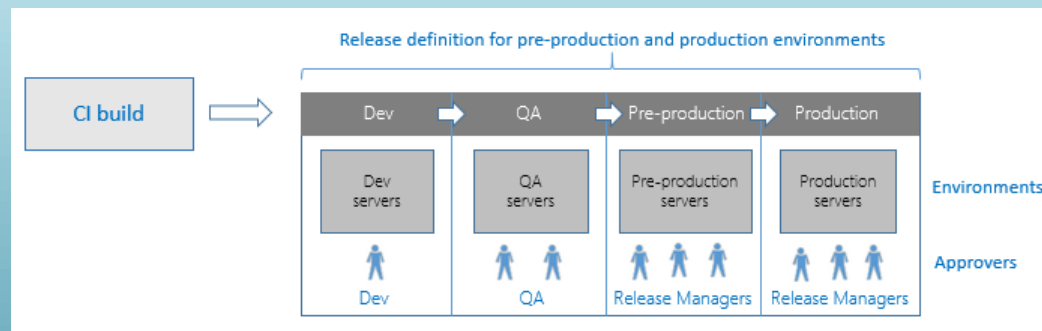
# Lab: 6B

- Create a build definition to build a web application

# Release Management

# RM Definition

- Release Management automates the deployment and testing of your software in multiple environments.





# RM is needed for

Develop applications and deploy them regularly to any platform

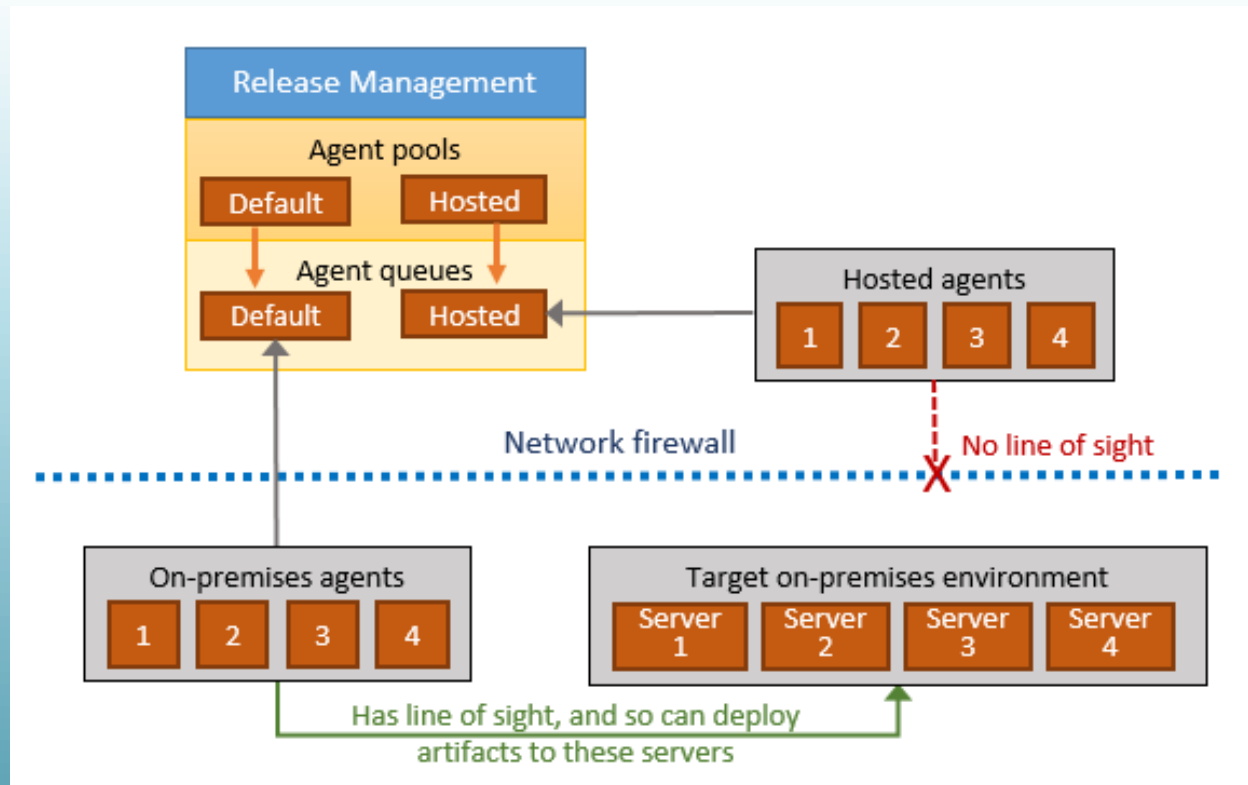
Implement Continuous Integration (CI) Continuous Deployment CD

Track the progress of releases

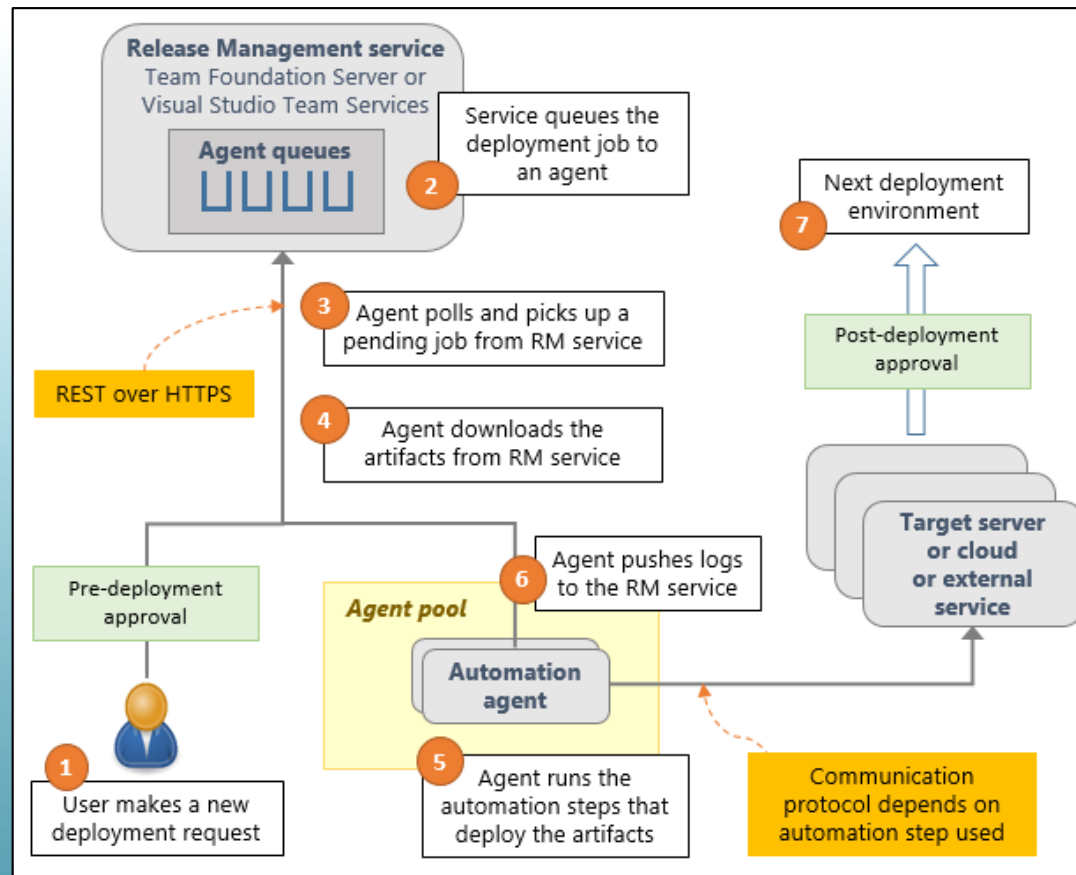
Control of the deployments

Audit history for all releases and their deployments

# RM Architecture



# RM Control flow



# RM Workflow

