



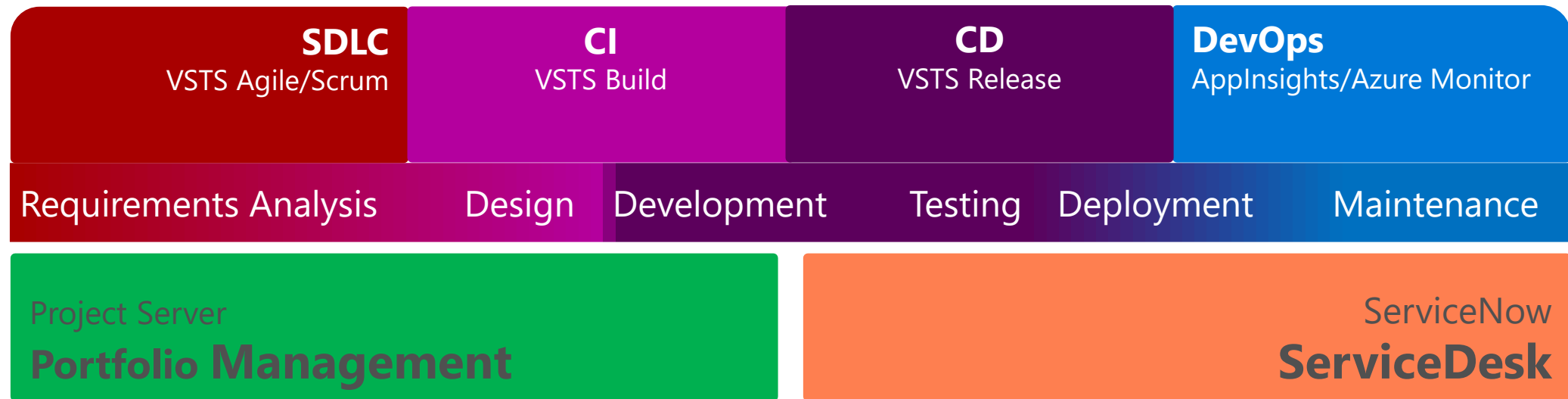
Application Lifecycle Management at Auckland Transport VSTS Continuous Integration Guidance

Nikolai Blackie
Premier Field Engineer Sub-Contractor

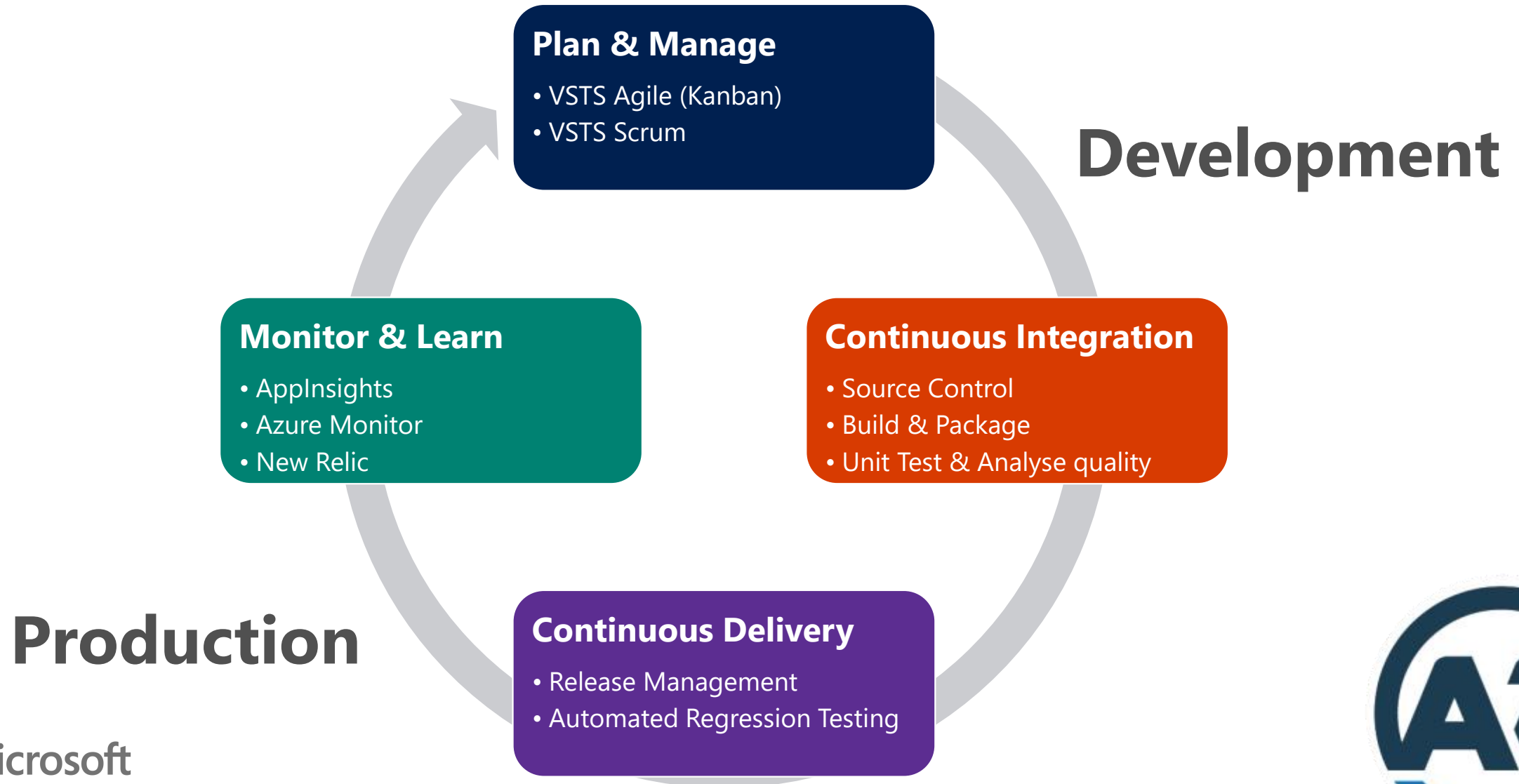


What is Application Lifecycle Management?

- Everything from birth to death of a product
- Agile methods are Auckland Transports preferred SDLC
- CI and CD tools help automate parts of the SDLC
- DevOps focus on the steps to get software built and deployed

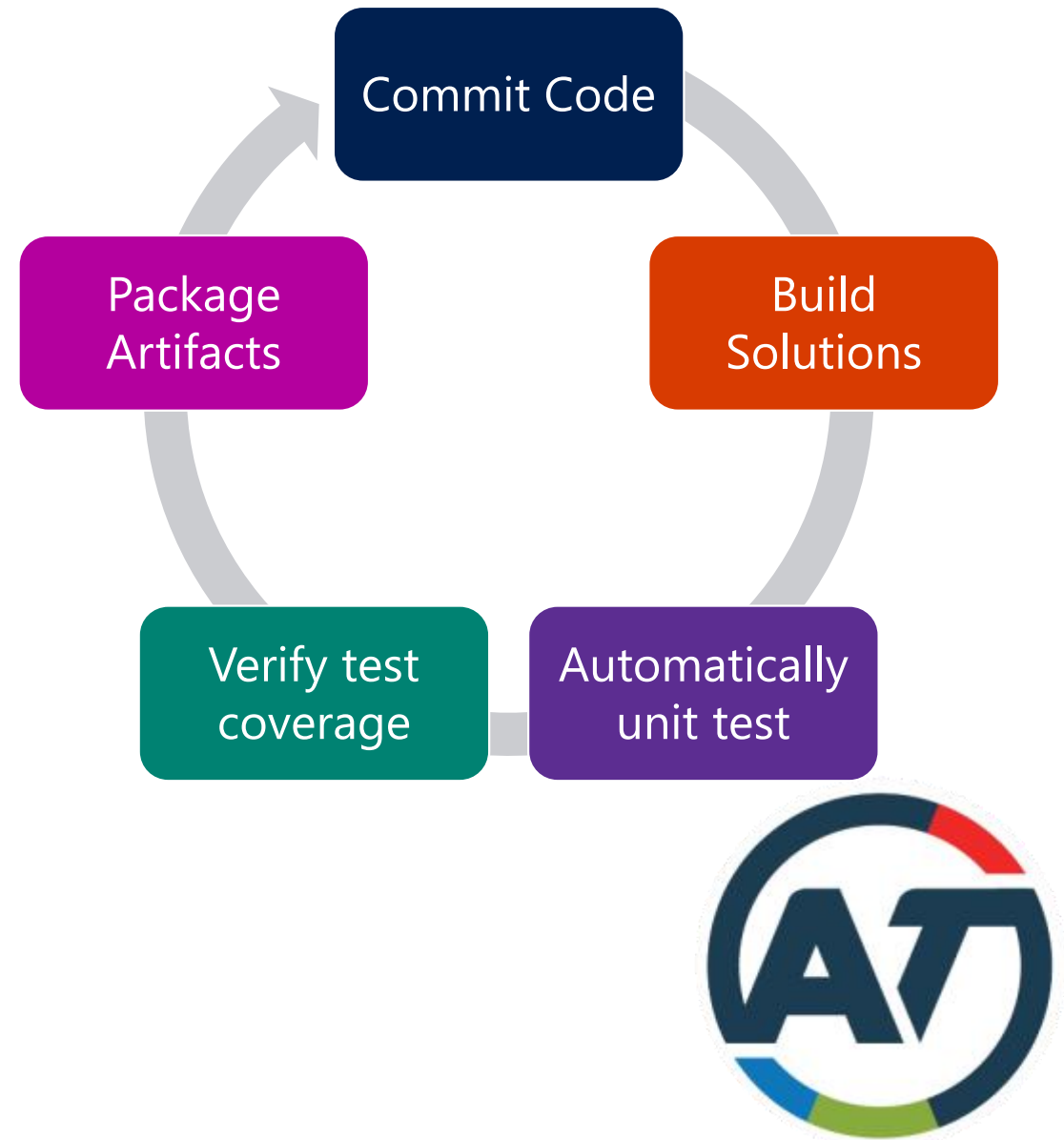


ALM at Auckland Transport



What is Continuous Integration?

- Automation of the build and testing of code
- Teams integrate their work with increasing frequency
- Errors and quality issues are detected as quickly as practical
- Outputs enable the continuous delivery of software

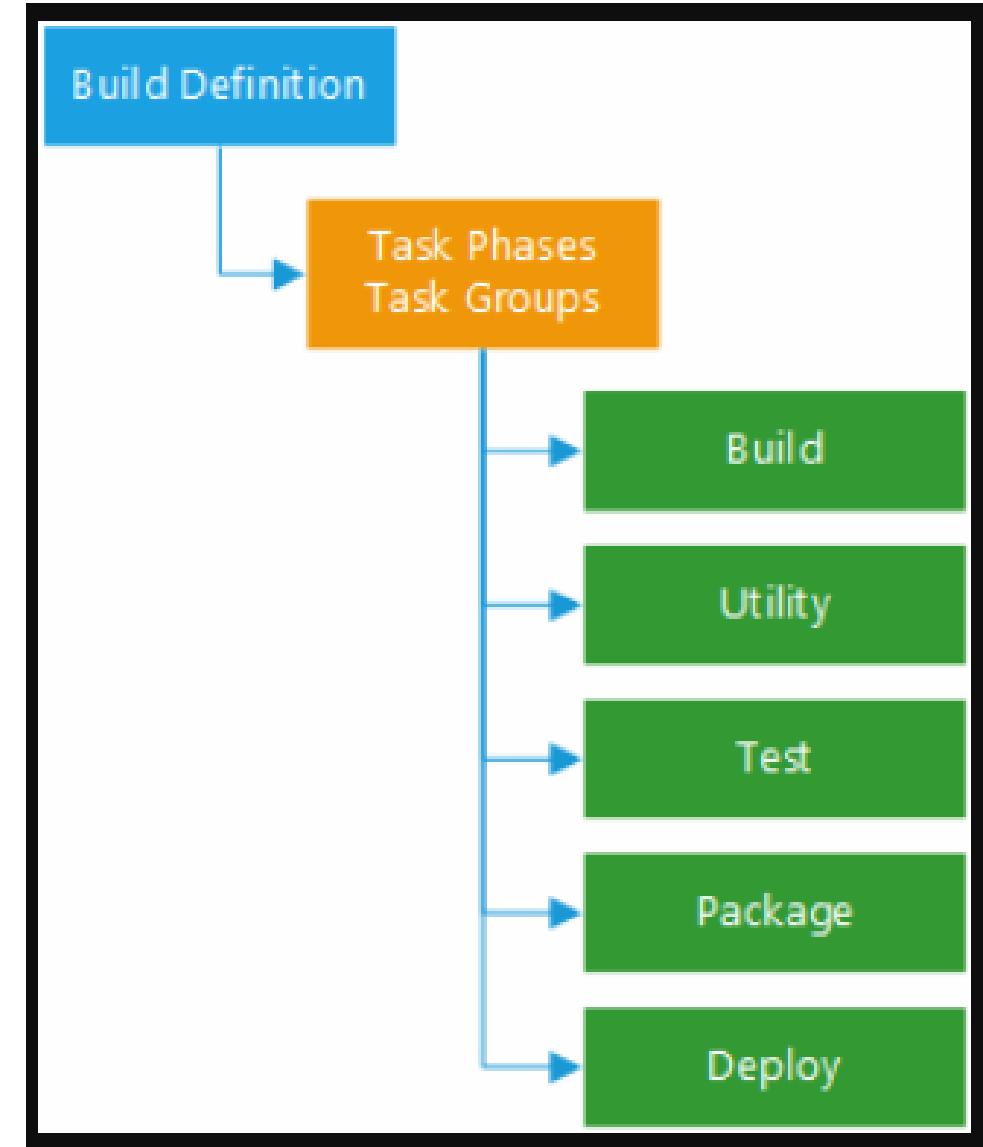


AT VSTS Continuous Integration Guidance

- Build Definitions
- Unit, Integration and Load Testing
- Unit Test Code Coverage
- SonarLint and SonarQube
- Build agents

Build Definitions

- Build and Utility Tasks
- Execute Unit, Integration and UI test the build
- Publish artifacts from your build
- Leverage task phases for parallel activities
- Leverage task groups for reuse
- Enable continuous integration (CI)



Unit Testing

- Run unit tests (MSTest, NUnit, xUnit, Mocha and Jasmine)
- Associate to test cases and results
- Recommended for CD
 - Run functional tests (CodedUI or [Selenium tests](#))
 - [Run load tests](#)

Requirements quality			...
Title	Failed	Pass rate	
11: As an engineer, I can make changes to an ...	0	<div><div></div></div> 100%	
12: As a user, I can open a support ticket	1	<div><div></div><div></div></div> 66%	
13: As a user, I can see my opened tickets	-	No linked tests	
14: As an engineer, I can schedule an appoint..	0	<div><div></div></div> 100%	
15: As an engineer, I can close service tickets	0	<div><div></div><div></div></div> 75%	
16: As an engineer, I can log into the portal	0	<div><div></div></div> 100%	
17: As a user, I can Escalate a support ticket	1	<div><div></div><div></div><div></div></div> 60%	
+ 2 more Requirements			Expand

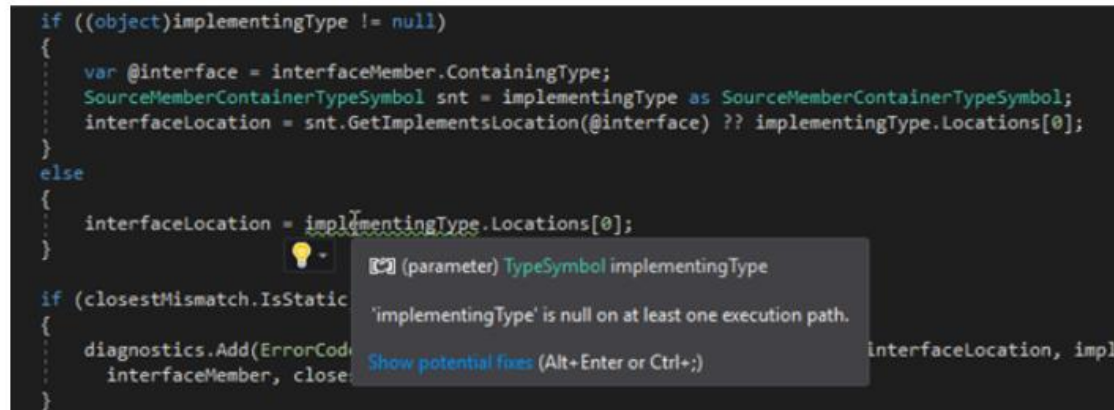
Unit Test Code Coverage

- Code coverage measures total unit test coverage
- Leverage dependency injection & interfaces
- Use runsettings and attributes to exclude code
- Auckland Transport min standard is 70% (ideally 100%)

29537...3031.coverage				
Hierarchy				
	Not Covered (Blocks)	Not Covered (% Blocks)	Covered (Blocks)	Covered (% Blocks)
29537...3031.coverage	93	21.88 %	332	78.12 %
alm.servicenow.functionapp.dll	0	0.00 %	218	100.00 %
alm.servicenow.functionapp.test.dll	93	44.93 %	114	55.07 %
ALM.ServiceNow.FunctionApp.Test.BusinessLogicTest	0	0.00 %	47	100.00 %
ALM.ServiceNow.FunctionApp.Test.ContractTest	0	0.00 %	67	100.00 %
ALM.ServiceNow.FunctionApp.Test.FunctionSmokeTest	93	100.00 %	0	0.00 %

SonarLint and SonarQube

- SonarLint is VS plugin to detect code quality issues
- SonarQube is a CI component that automates rule checks
- For the C# language there are 352 rules that are verified.
 - 5 languages supported: C#, VB.Net, C, C++ and Javascript.
 - Open source, Roslyn based code analyzers.
 - Deep code analysis algorithms using pattern matching and dataflow analysis
 - Hundreds of rules, and growing.
 - Comes with explanations to resolve detected issues.



```
if ((object)implementingType != null)
{
    var @interface = interfaceMember.ContainingType;
    SourceMemberContainerTypeSymbol snt = implementingType as SourceMemberContainerTypeSymbol;
    interfaceLocation = snt.GetImplementsLocation(@interface) ?? implementingType.Locations[0];
}
else
{
    interfaceLocation = implementingType.Locations[0];
}

if (closestMismatch.IsStatic)
{
    diagnostics.Add(ErrorCode, interfaceMember, closestMismatch, interfaceLocation, impl
```

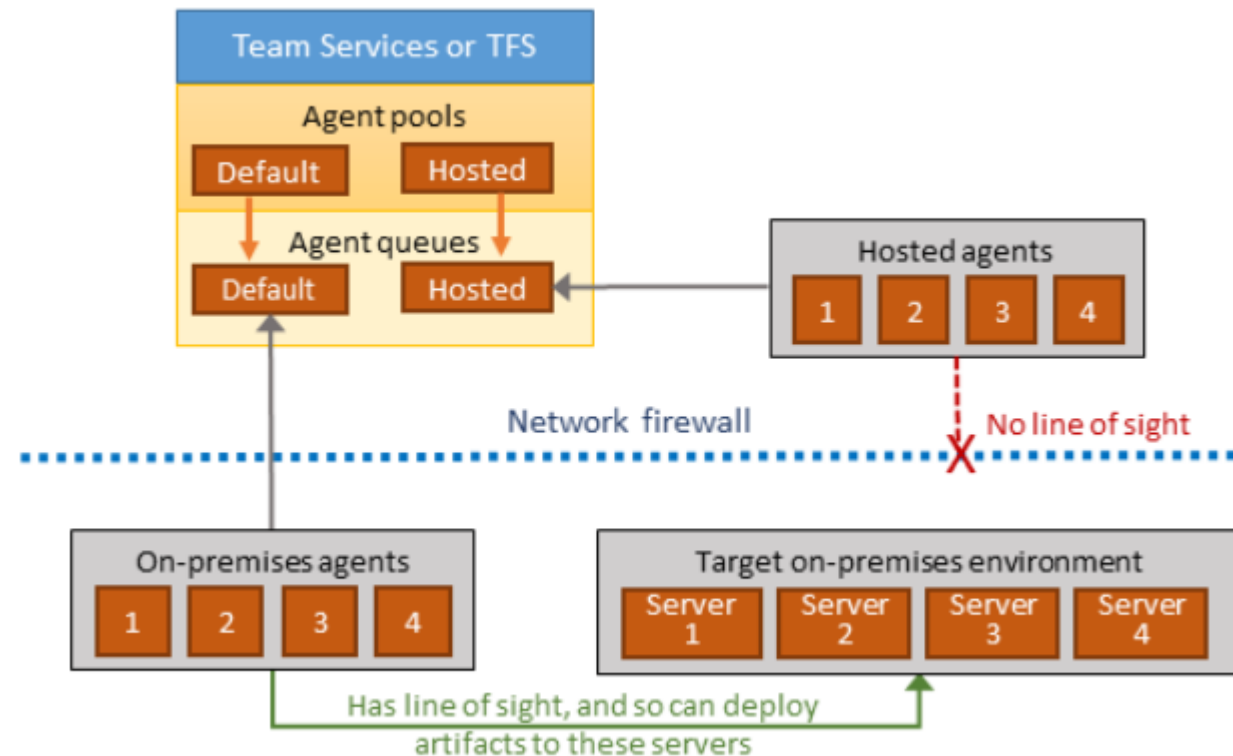
(parameter) TypeSymbol implementingType

'implementingType' is null on at least one execution path.

Show potential fixes (Alt+Enter or Ctrl+;)

Build Agents

- Execute build/release processes on build agents
- MS supply hosted agents i.e. VS 2017
- For specific builds & on-premise leverage custom



Lab: Continuous Integration using Visual Studio Team Services

Wrap Up & Questions



Microsoft





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