



Azure ALM with AB Suite

Managing AB Suite Development with Azure

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Overview

- Managing AB Suite application development on a day to day basis
- Initial set up of Azure Devops and AB Suite development described in article on [Unisys support web site](#)
- Training available on how to set up Agile Business Suite development environment
- Review processes from initial idea to completed solution
 - Assumes Source Control Environment is set up and working

Recommendations

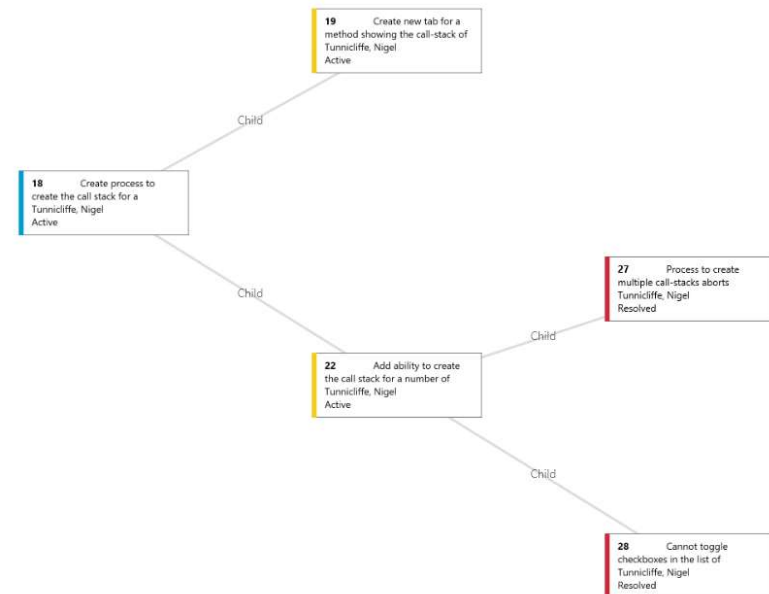
- Enable the option to associate all changes with a Work Item
- Enable the option to force a comment to be associated with a check-in
 - Educate developers to make this meaningful

Agile Terminology

- Sprint
 - Time boxed period of development typically less than a month in duration
 - Working system delivered at the end of each sprint
- BackLog
 - 'To-do' list of new features, enhancements and bugs
 - Each item recorded as a 'WorkItem'
- Story Point
 - Estimate of the effort required to develop a new feature, enhancement, fix a bug
 - Developer productivity measure in 'Story Points' they can complete in a given time period

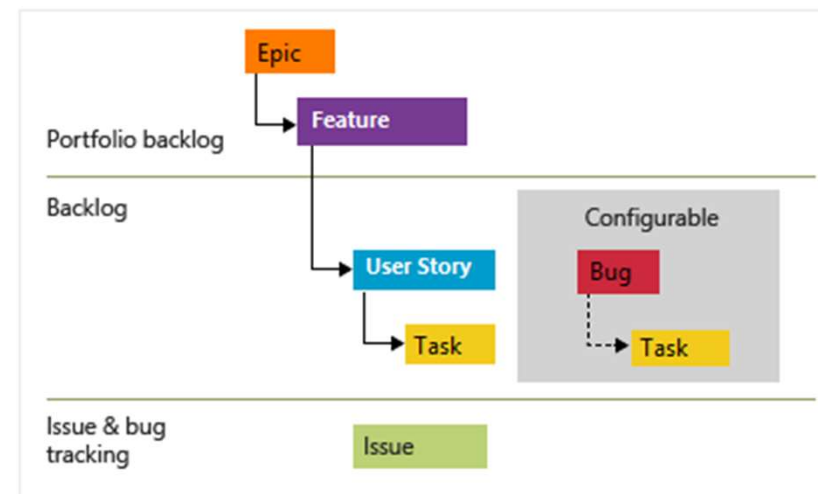
Azure Devops Work Items

- Used to track any work performed against the AB Suite application and its associated artefacts
- Different types depending on the methodology selected
 - Azure supports 'Basic', Agile, SCRUM and Capability Maturity Model Integration
- Can (and should) be linked. E.g.
 - Task linked to a User Story
 - Bug linked to parent task

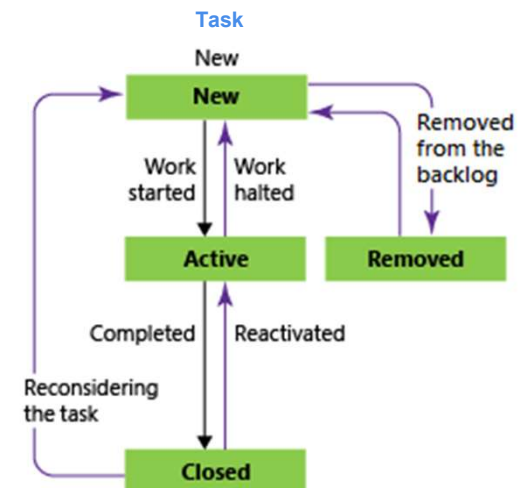
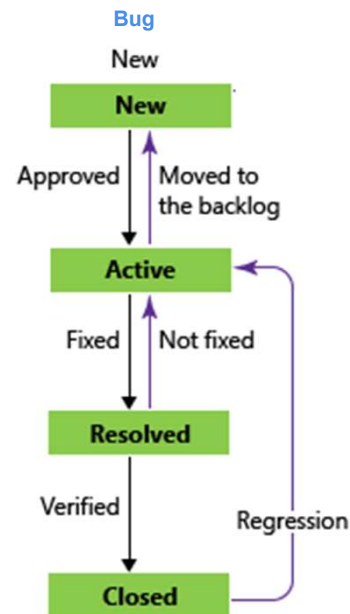
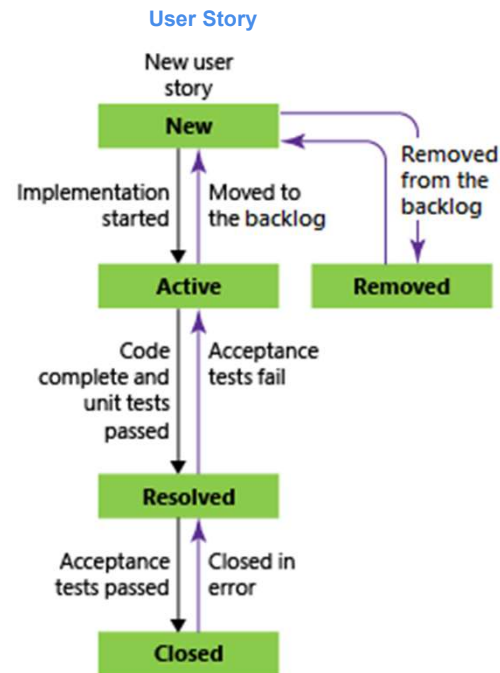


Agile Work Items

- EPIC
 - Major new development
- Feature
 - Feature of the development
- User Story
 - User interaction with the system
- Task
 - Work required to implement a user story
- Bug
 - Fault in the system
- Issue
 - External work required to implement a feature



Work Item State Flow



<https://docs.microsoft.com/en-us/azure/devops/boards/work-items/guidance/agile-process-workflow?view=azure-devops>

Custom Methodology

- Extend inbuilt Methodology
 - Custom Work Items
 - Custom steps in the workflow

Create new project



Collection name

Agile Business Suite Utilities

Project name *

School System



Description

Basic AB Suite System

^ Advanced

Version control ?

Team Foundation Version Control



Work item process ?

AB Suite Agile



[Show description](#)

gb-es3w1

Work Items - Boards

New Bug 2* - Boards

Agile Business Suite Utilities / Matrix / Boards / Work Items

Search

Matrix

Overview

Boards

Work Items

Boards

Backlogs

Sprints

Queries

Repos

Pipelines

Test Plans

Artifacts

Project settings

Work Items

Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

Details

History

Link

Share

StateNew

ReasonNew

AreaMatrix

IterationMatrix

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority2

Severity3 - Medium

Activity

Effort (Hours)

Original Estimate

Remaining

Completed

Development

Add link

Related Work

Add link

System Info

Found in Build

Integrated in Build

100%

11:04 15/09/2020

gb-es3w1

Work Items - Boards

New Bug 2* - Boards

Agile Business Suite Utilities / Matrix / Boards / Work Items

Search

Matrix

Overview

Boards

Work Items

Boards

Backlogs

Sprints

Queries

Repos

Pipelines

Test Plans

Artifacts

Project settings

Work Items

Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

StateNewAreaMatrixReasonNewIterationMatrix

Details

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

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Resolved Reason

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Original Estimate

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Development

Add link

Related Work

Add link

System Info

Found in Build

Integrated in Build

11:04

15/09/2020

gb-es3w1

Work Items - Boards

New Bug 2* - Boards

Agile Business Suite Utilities / Matrix / Boards / Work Items

Search

Matrix

Overview

Boards

Work Items

Boards

Backlogs

Sprints

Queries

Repos

Pipelines

Test Plans

Artifacts

Project settings

Work Items

Back to Work Items

Who the item has been assigned to

Unassigned0 commentsAdd tag

Save

Details

History

Link

Share

StateNew

ReasonNew

AreaMatrix

IterationMatrix

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

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Integrated in Build

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15/09/2020

Matrix

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Work Items

Boards

Backlogs

Sprints

Queries

Repos

Pipelines

Test Plans

Artifacts

Project settings

Agile Business Suite Utilities / Matrix / Boards / Work Items

Work Items

Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned

0 comments

Assign tag

Save

Details

History

Link

Share

State: New

Reason: New

Area: Matrix

Iteration: Matrix

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority

2

Severity

3 - Medium

Activity

Effort (Hours)

Original Estimate

Remaining

Completed

Development

Add link

Related Work

Add link

System Info

Found in Build

Integrated in Build

100%

11:04 15/09/2020

gb-es3w1

Work Items - Boards

New Bug 2* - Boards

Agile Business Suite Utilities / Matrix / Boards / Work Items

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Sprints

Queries

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Pipelines

Test Plans

Artifacts

Project settings

Work Items

Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

Details

State: New

Reason: New

Area: Matrix

Iteration: Matrix

How to reproduce the problem

Click to add Repro Steps

System Info

Click to add System Info

Discussion

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority

2

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Related Work

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Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

Details

StateNew

ReasonNew

AreaMatrix

IterationMatrix

Repro Steps

Click to add Repro Steps

Software levels

Click to add System Info

Discussion

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority2

Severity3 - Medium

Activity

Effort (Hours)

Original Estimate

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Development

Add link

Related Work

Add link

System Info

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Project settings

Work Items

Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

Details

State: New

Reason: New

Area: Matrix

Iteration: Matrix

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion about the work item

Add a commentUse # to link a work item, I to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority

2

Severity

3 - Medium

Activity

Effort (Hours)

Original Estimate

Remaining

Completed

Development

Add link

Related Work

Add link

System Info

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Integrated in Build

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15/09/2020

gb-es3w1

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NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

Details

State: New

Reason: New

Area: Matrix

Iteration: Matrix

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority: 2

Severity

Effort (Hours)

Original Estimate

Remaining

Completed

Development

Add link

Related Work

Add link

System Info

Found in Build

Integrated in Build

Effort needed to fix the problem

11:04

15/09/2020

gb-es3w1

Work Items - Boards

New Bug 2* - Boards

Agile Business Suite Utilities / Matrix / Boards / Work Items

Search

Matrix

Overview

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Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

StateNew

ReasonNew

AreaMatrix

IterationMatrix

Development History

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Planning

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Activity

Effort (Hours)

Original Estimate

Remaining

Completed

Development

Add link

Related Work

Add link

System Info

Found in Build

Integrated in Build

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Boards

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Agile Business Suite Utilities / Matrix / Boards / Work Items

Work Items

Back to Work Items

NEW BUG * Field 'Title' cannot be empty.

Unassigned0 commentsAdd tag

Save

Details

StateNew

ReasonNew

AreaMatrix

IterationMatrix

Repro Steps

Click to add Repro Steps

System Info

Click to add System Info

Discussion

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Planning

Resolved Reason

Story Points

Priority2

Severity3 - Medium

Activity

Effort (Hours)

Original Estimate

Remaining

Completed

Development

Links to parent task, related issues

Related Work

Add link

System Info

Found in Build

Integrated in Build

100%

11:04 15/09/2020

gb-es3w1

gb-es3w1

New Define New Bundle 1: ...

Add a custom rule to a work it...

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_workit

Azure DevOps

School System

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Boards

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Boards

Backlogs

Sprints

Queries

Repos

Pipelines

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Artifacts

Project settings

Agile Business Suite Utilities / School System / Boards / Work Items

Search

Custom Work Item

NEW DEFINE NEW BUNDLE

Field 'Title' cannot be empty.

Unassigned0 commentsAdd tagSave

StateNew

ReasonMoved to state New

AreaSchool System

IterationSchool System

Details

Description

Click to add Description

Bundle details

Generator Name

Name

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

Ispecs to Include

Click to add Ispecs to Include

Development

Add link

Related Work

Add link

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_boards

100%

15:1724/09/2020

gb-es3w1

gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_workit

New Define New Bundle 1: ...

Add a custom rule to a work it...

Azure DevOps

Agile Business Suite Utilities / School System / Boards / Work Items

Search

School System

Overview

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Boards

Backlogs

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Queries

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Pipelines

Test Plans

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Project settings

Work Items

Back to Work Items

NEW DEFINE NEW BUNDLE

Field 'Title' cannot be empty.

Unassigned 0 comments Add tag Save

State New

Reason Moved to state New

Area School System

Iteration School System

Details

Description

Custom Bundle Details

Bundle details

Generator Name

Name

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

Ispecs to Include

Click to add Ispecs to Include

Development

Add link

Related Work

Add link

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_boards

100%

15:17 24/09/2020

gb-es3w1

gb-es3w1

New Define New Bundle 1: ...

Add a custom rule to a work it...

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_workit

Azure DevOps

Agile Business Suite Utilities / School System / Boards / Work Items

School System

Overview

Boards

Work Items

Boards

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Sprints

Queries

Repos

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Back to Work Items

NEW DEFINE NEW BUNDLE

Field 'Title' cannot be empty.

Unassigned 0 comments Add tag

Save

State

New

 Reason Moved to state New Area School System Iteration School System

Description

Click to add Description

Bundle details

Generator Name

Name

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

Ispecs to include in the bundle

Ispecs to Include

Click to add Ispecs to Include

Development

Add link

Related Work

Add link

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_boards

100%

15:17

24/09/2020

gb-es3w1

gb-es3w1

New Define New Bundle 1: ...

Add a custom rule to a work it...

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_workit

SS

School System

Overview

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Queries

Repos

Pipelines

Test Plans

Artifacts

Project settings

Agile Business Suite Utilities / School System / Boards / Work Items

Search

Work Items

Back to Work Items

NEW DEFINE NEW BUNDLE

Field 'Title' cannot be empty.

Unassigned

0 comments

Add tag

Save

State

New

Area

School System

Reason

Moved to state New

Iteration

School System

Details

Description

Click to add Description

Bundle details

Generator Name

Name

Discussion

Add a comment. Use # to link a work item, ! to link a pull request, or @ to mention a person.

Ispecs to Include

Click to add Ispecs to Include

Development

Add link

Related Work

Add link

http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_boards

100%

15:17 24/09/2020

Example Work Item

The screenshot displays the Azure DevOps interface for a specific work item. The left sidebar shows the navigation menu with 'Matrix' selected. The main content area shows a work item titled '25 Method Line number not shown in summary Excel Spreadsheet' by 'Tunncliffe, Nigel'. The status is 'Resolved' and the area is 'Matrix'. The 'Repro Steps' section contains instructions to create a call-stack and export results to a CSV file. The 'System Info' section is empty. The 'Discussion' section shows a comment from 'Tunncliffe, Nigel' stating the issue was resolved with changeset 50. The right sidebar shows the 'Development' section with a link to the build 'Matrix Build_20200915.1' and the 'Related Work' section with a link to the parent work item.

Work Item Details:

- Title:** 25 Method Line number not shown in summary Excel Spreadsheet
- Author:** Tunncliffe, Nigel
- Status:** Resolved
- Area:** Matrix
- Reason:** Fixed
- Iteration:** Matrix
- Updated:** 8 hours ago

Repro Steps:

Create a call-stack for a method and export the results to a CSV file. The CSV File shows the method name, the owner and the description but not the line number where the method is invoked from.

System Info:

Discussion:

Add a comment. Use # to link a work item, I to link a pull request, or @ to mention a person.

Tunncliffe, Nigel commented Yesterday (edited)

Resolved with changeset 50: Created new column in workbook showing the line number.

Development:

+ Add link

Integrated in build [Matrix Build_20200915.1](#)
8 hours ago, ✓ succeeded

Changeset 50
Created Monday

Related Work:

+ Add link

Parent

24 Show line number where method is called in the list of e...
Updated 8 hours ago, ● Resolved

System Info:

Found in Build

Integrated in Build

Work Item History

The screenshot displays the Azure DevOps web interface for a work item. The left sidebar shows the navigation menu with options like Matrix, Overview, Boards, Work Items, Backlogs, Sprints, Queries, Repos, Pipelines, Test Plans, and Artifacts. The main area shows a work item titled "25 Method Line number not shown in summary Excel Spreadsheet" by Tunncliffe, Nigel. The work item is in the "Resolved" state. Below the work item details, there is a "State Graph" showing the progression from New to Resolved. The "History" section lists recent actions, including changing repro steps, editing comments, and changing the state. A "Repro Steps" section provides instructions on how to create a call-stack for a method and export the results to a CSV file.

Work Item Details:

- Title:** 25 Method Line number not shown in summary Excel Spreadsheet
- Author:** Tunncliffe, Nigel
- State:** Resolved
- Area:** Matrix
- Reason:** Fixed
- Iteration:** Matrix
- Updated by:** Tunncliffe, Nigel 15/09/2020

State Graph:

```

graph LR
    New[Tunncliffe, Nigel 14/09/2020] --> Approved[Tunncliffe, Nigel 14/09/2020]
    Approved --> Active[Tunncliffe, Nigel 14/09/2020]
    Active --> Fixed[Tunncliffe, Nigel 14/09/2020]
    Fixed --> Resolved[Tunncliffe, Nigel 14/09/2020]
  
```

History:

- Tunncliffe, Nigel changed Repro Steps 15/09/2020
- Tunncliffe, Nigel edited a comment: Resolved with changeset 50: Created new column in workbook showing the line number. 15/09/2020
- 000007F5-0000-8888-8000-000000000000@00000000-0000-0000-0000-000000000000... 15/09/2020
- Tunncliffe, Nigel changed state from Active to Resolved, added a comment, adde... 14/09/2020
- Tunncliffe, Nigel changed state from New to Active, made other changes 14/09/2020
- Tunncliffe, Nigel created the Bug, added Parent link 14/09/2020

Repro Steps:

Create a call-stack for a method and export the results to a CSV file. The CSV File shows the method name, the owner and the description but not the line number where the method is invoked from.

Notifications

- Azure Devops can be configured to send e-mails to individuals or groups at specified points
 - When a new work item is allocated
 - When a work item changes state
 - When a build completes successfully
 - When a build fails
- 'Follow' a particular work item
 - Notified when the state of a work item changes
 - Notified when you are 'mentioned' in a discussion
- Very useful for distributed teams

[Build succeeded] Matrix Build - Matrix - Matrix - Message (HTML)

File Message Help Tell me what you want to do

Ignore Delete Archive Reply Reply All Forward More Meeting Expenses Team Email Move to: ? Done To Manager Reply & Delete Create New

Quick Steps

Move OneNote Actions

Mark Unread Categorize Follow Up Tags

Translate Find Related Select Editing

Read Aloud Speech Zoom Report Phishing

[Build succeeded] Matrix Build - Matrix: - Matrix -

A AzureDevOps@Unisys.com
To Tunncliffe, Nigel

Reply Reply All Forward ...

Thu 10/09/2020 18:23

Details

Agent job 1
0 error(s), 42 warning(s)

Work items

- [Task 19](#) Create new tab for a method showing the call-stack of how a method can be invoked New
- [Bug 20](#) Call Stack stops at an insert and does not find the process invoking the Insert command Resolved

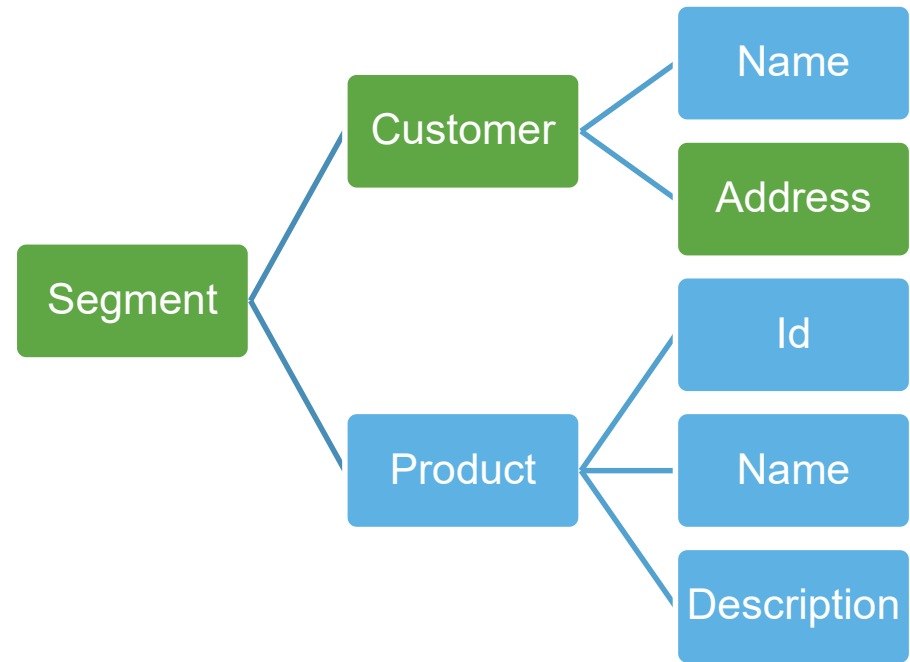
Commits

- [C43](#) Update version number and change log to show new features Tunncliffe, Nigel
- [C42](#) Fix search to use first element of name when looking at the commands table. Plus updates to display Tunncliffe, Nigel
- [C41](#) Added code to run the search on a separate thread. Tunncliffe, Nigel
- [C40](#) Before updating parser to run on a separate thread Tunncliffe, Nigel

We sent you this notification due to a default subscription. [View](#) | [Unsubscribe](#)
Sent from Azure [DevOps](#) Server

AB Suite Version Files

- Versioned elements
 - Segment, Customer, Address
- Non-Versioned elements
 - Customer Name, Id, Product Name, Product, Description
- Editing 'Description' will cause that entity and all non-versioned parent elements to be checked out.
 - i.e. It checks out the Segment



Best Practices

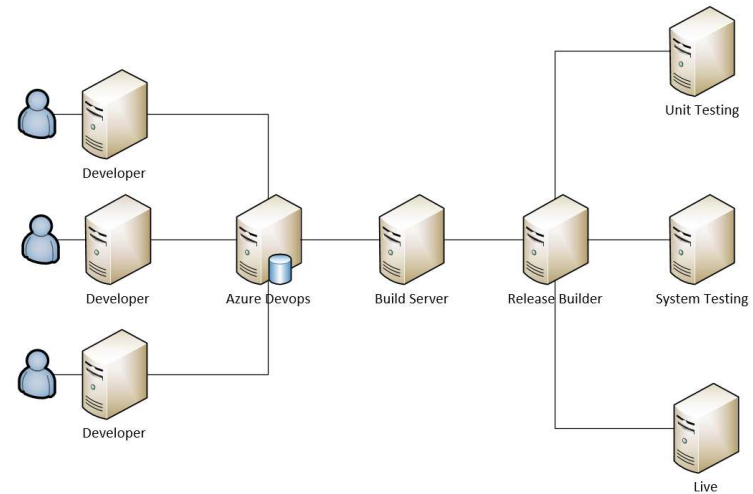
- Create new artefacts using the Add>Add New Item process menu selection
 - Ensures the version file is set correctly
- Check in new Ispecs/reports etc immediately after creating them
 - Allows other developers to add new artefacts
- Perform branching when nothing is checked out



Pipelines

Logical Architecture

- Developer Systems
 - Local copy of Agile Business Suite application
- Azure Server
 - Controls Application Life Cycle
- Build Server
 - Builds MSI and/or ClearPath source code
- Release Server
 - Deploys the system to target environment



Azure Pipelines

- Azure uses 'pipelines' to define Build and Release processes
- Build re-compiles and creates release artefacts but does not release
- Release copies artefacts to appropriate test locations and performs actions to create a new release

Build Pipeline

- Builds can be started manually or triggered
 - Continuous Integration Build
 - Starts after every check-in
 - Gated check-in
 - Code must have been built locally before being checked in
 - Scheduled
 - At predefined times/days
 - After another build completes

Matrix

Overview

Boards

Repos

Pipelines

Builds

Releases

Library

Task groups

Deployment groups

Test Plans

Artifacts

Project settings

Agile Business Suite Utilities / Matrix / Pipelines

Matrix Build

Tasks Variables Triggers Options Retention History Save & queue Discard Summary Queue

Continuous integration

Matrix Disabled

Gated check-in

Matrix Disabled

Scheduled

3:00 Mon through Fri

Build completion

Build when another build completes

Mon through Fri at 3:00

When to build

Mon Tue Wed Thu Fri Sat Sun

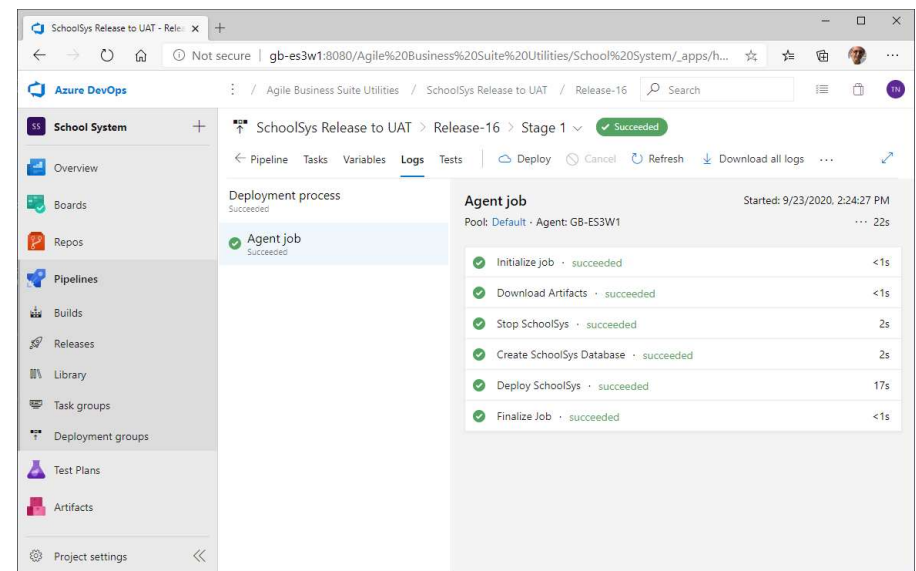
03h 00m (UTC+00:00) Dublin, Edinburgh, Lisbon, London

Only schedule builds if the source or pipeline has changed

12:54 17/09/2020

Release Pipeline

- Releases artefacts created during build
 - Continuous Integration
 - At specific times
- Can deploy to one or more servers
 - Deploy core Agile Business Suite application
 - Deploy custom clients



Approving Releases

The screenshot displays the Azure DevOps web interface. On the left is a navigation pane with options like Overview, Boards, Repos, Pipelines, Builds, Releases, Library, Task groups, Deployment groups, Test Plans, and Artifacts. The main area shows a release titled 'SchoolSys Release to UAT > Release-22 : Build School System' with a status of '[Pre-deployment approval pending]'. A message from 'AzureDevOps@Unisys.com' to 'Tunncliffe, Nigel' is shown. The release is for 'School System / 72' and is requested for 'Tunncliffe, Nigel'. A 'View approval' button is present. Below this is a 'Summary' box containing details: Release description (Triggered by School System 72), Deployment trigger (automated: after release creation), Requested for (Tunncliffe, Nigel), and Attempt (1). On the right, there are settings for the release, including a toggle for 'Reject deployments to this stage' (Enabled) and a section for 'Users and groups for approvers'.



Automated Test Tool

Testing with ATT

- ATT Tool supplied as part of Agile Business Suite development environment
- Creates a standard .Net Test application
- Automated testing as part of development or a release
 - Recording an ATT Script is built into all Unisys generated clients
 - Can be added to custom clients



Testing Guidelines

- Each test opens a new connection with the AB Suite application
- Use descriptive names for test methods
 - Eg 'ShouldReturnCustomerName'
- Tests should run quickly
 - Don't configure starting a 3 hour report as an ATT Test
- Tests must be repeatable
 - May need to restore the database between tests
 - Use 'TestInitialize' and 'TestCleanUp' attributes to invoke code before and after a test
- Tests should not rely on some external system which may not be present
 - If essential use a 'mocking' framework

Test Results

- XML File created showing results from a test

Configure continuous integration
Setup continuous integration(CI) builds to test continuously after every code change.

Don't show this again

Run All | Run... | Playlist: All Tests

Passed Tests (1)

ShouldReturnThreeStudents

ShouldReturnThreeStudents

Source: NewSMTest.cs line 43

Test Passed - ShouldReturnThreeStudents

Elapsed time: 434 ms

Output

Test Name: ShouldReturnThreeStudents

Test Outcome:  Passed

Attachments

GB-TUNNICLN_TunnickliffeN 2017-05-16 11_33_43 NewSMTest.xml

```
<?xml version="1.0" encoding="UTF-8"?>
- <SMTTestResult Failed="0" Passed="3" Total="3" EndTime="2017-05-13T16:26:03.7309199+01:00" StartTime="2017-05-13T16:26:01.9789122+01:00" Outcome="Passed" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <ErrorMessage/>
  - <SMTTestStepResult EndTime="2017-05-13T16:26:03.6734217+01:00" StartTime="2017-05-13T16:26:01.9929078+01:00" Outcome="Passed" SessionTag="DefaultSession" ID="9dacecf3-bef1-4023-852e-713a5a3d3cdf" Name="Submit Ispec - STU">
    - <SMTTestStepFieldItemResults>
      - <SMTTestStepFieldItemResult Valid="true">
        <FieldName>Errors</FieldName>
        <Condition>Equal</Condition>
        <ExpectedValue/>
        <ActualValue/>
        <ErrorMessage/>
      </SMTTestStepFieldItemResult>
      - <SMTTestStepFieldItemResult Valid="true">
        <FieldName>FormName</FieldName>
        <Condition>Equal</Condition>
        <ExpectedValue>STU</ExpectedValue>
        <ActualValue>STU</ActualValue>
        <ErrorMessage/>
      </SMTTestStepFieldItemResult>
      - <SMTTestStepFieldItemResult Valid="true">
        <FieldName>ReturnCode</FieldName>
        <Condition>Equal</Condition>
        <ExpectedValue>100</ExpectedValue>
        <ActualValue>100</ActualValue>
        <ErrorMessage/>
      </SMTTestStepFieldItemResult>
      - <SMTTestStepFieldItemResult Valid="true">
        <FieldName>Status</FieldName>
        <Condition>Equal</Condition>
        <ExpectedValue>INQUIRY REQUEST</ExpectedValue>
        <ActualValue>INQUIRY REQUEST</ActualValue>
        <ErrorMessage/>
      </SMTTestStepFieldItemResult>
      - <SMTTestStepFieldItemResult Valid="true">
        <FieldName>_UserMAINT</FieldName>
        <Condition>Equal</Condition>
        <ExpectedValue>INQ</ExpectedValue>
        <ActualValue>INQ</ActualValue>
        <ErrorMessage/>
      </SMTTestStepFieldItemResult>
      - <SMTTestStepFieldItemResult Valid="true">
        <FieldName>STUDENT</FieldName>
```

Test Driven development

- Development approach where the test is written first
 - Define an Ispec with only fields and no logic
 - Define one or more ATT tests against the Ispec
 - Run the tests – they will fail
 - Write the code to pass the tests



Putting it all together

Back

Forward

Address bar: http://gb-es3w1:8080/Agile%20Business%20Suite%20Utilities/School%20System/_build? Builds - Pipelines

Azure DevOps

Agile Business Suite Utilities / School System / Pipelines / Builds

Search

100%

School System

Overview

Boards

Repos

Pipelines

Builds

Releases

Library

Task groups

Deployment groups

Test Plans

Artifacts

Project settings

Search all pipelines

New

School System

\$/School System

School System

History Deleted Analytics

Queue build for School System

Agent pool

Default

Source version

Shelveset name

Variables Demands

system.debug false

+ Add

Queue Cancel

Branch

Queued

Duration

\$/School System 2020-09-30 13:13 0:22.954

\$/School System 2020-09-30 12:10 0:25.235

\$/School System 2020-09-24 12:59 0:21.629

\$/School System 2020-09-24 12:56 0:21.693

\$/School System 2020-09-24 10:55 0:22.661

\$/School System 2020-09-24 10:49 0:22.665

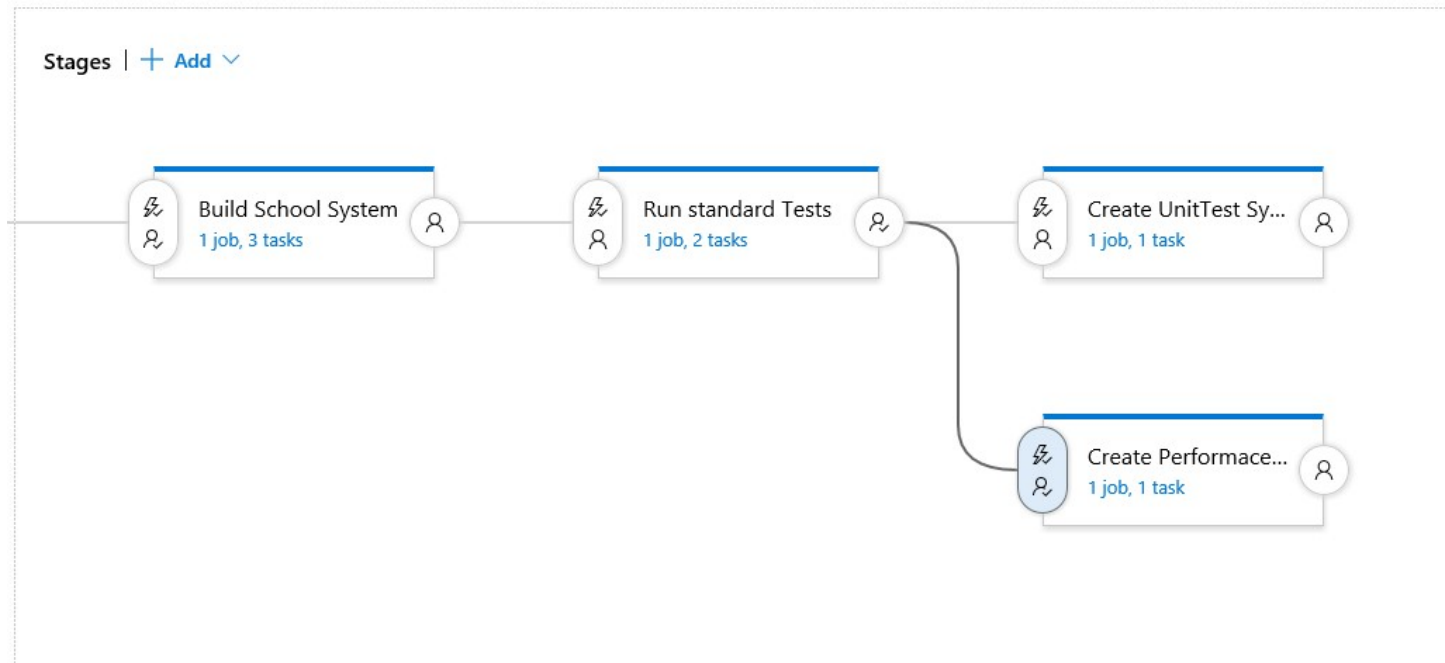
\$/School System 2020-09-23 18:07 0:22.688

\$/School System 2020-09-23 14:20 0:19.633

Windows Taskbar

13:22 30/09/2020

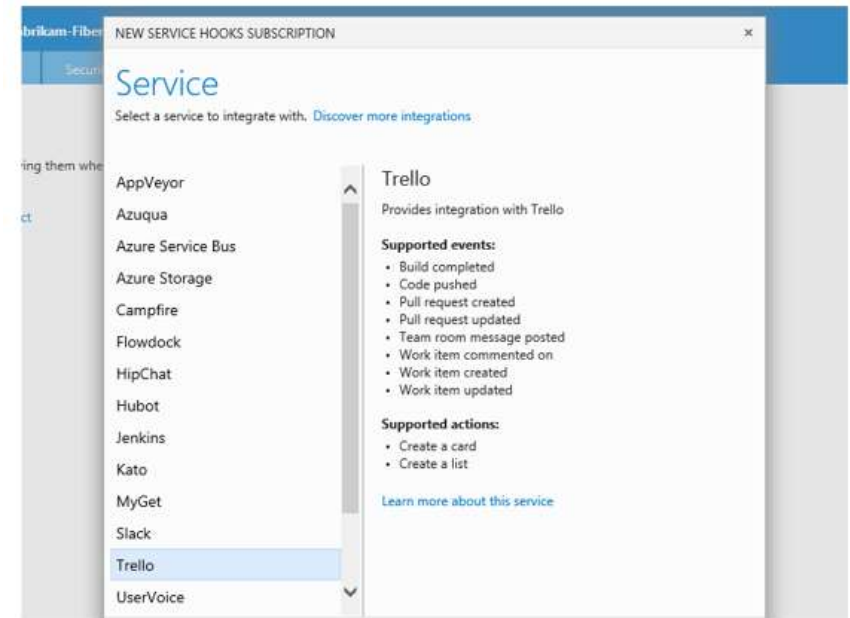
More Complex Pipeline





Other Suggested Features

- Create a 'WIKI' for your project
 - How to's
 - Example code
 - Documentation
- Create hooks into services
 - Trello
 - Jenkins
 - Many more





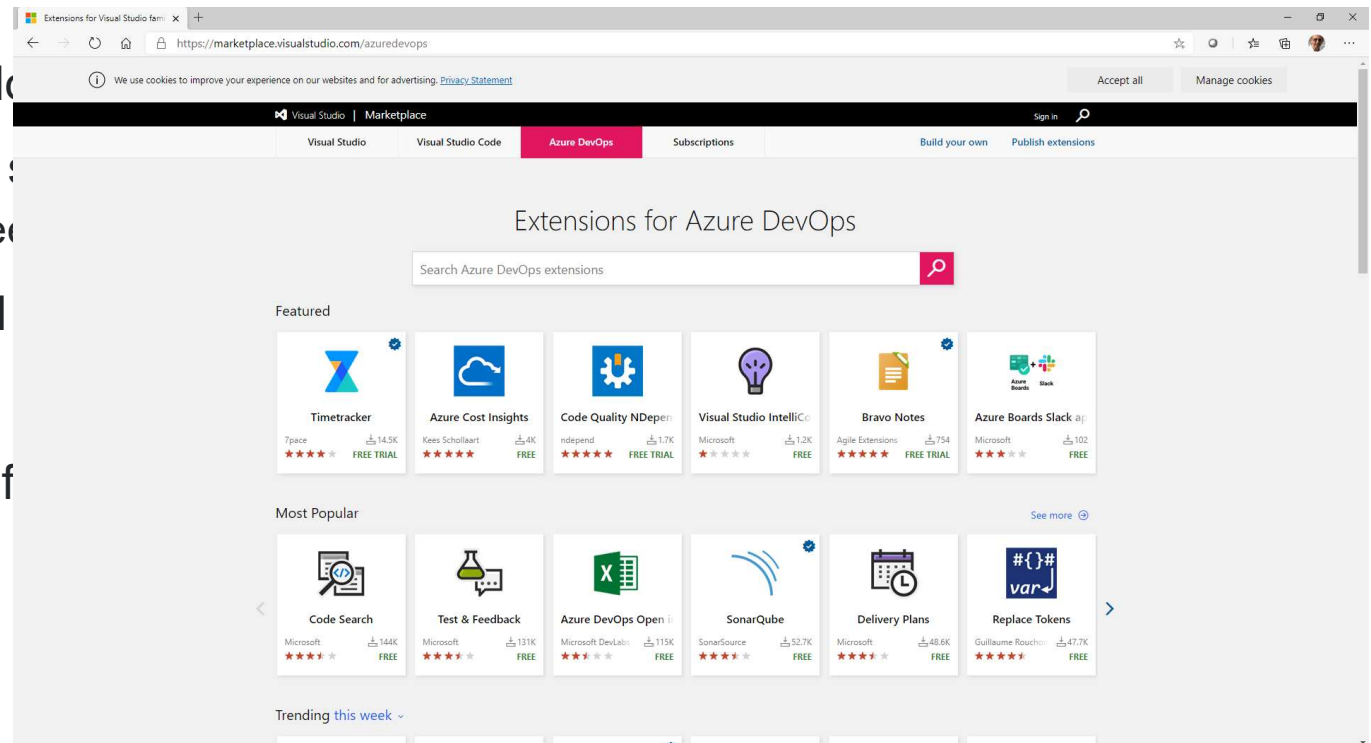
Conclusions

Conclusions

- Azure Devops is a lot more than a version control system
- No 'one-size fits all solution'
 - Configurable to meet your own unique way of working
- Can used to control the entire end-to-end lifecycle of application development
- Extensible
- Large marketplace for add-ons

Conclusions

- Azure DevOps is a lot more than just CI/CD
- No 'one-size fits all' solution
 - Configurable to meet your needs
- Can be used to control your development process
- Extensible
- Large marketplace for extensions



Thank You
