

Seminar

S1

Software Engineering

Computer Science School
DSIC – UPV

Chapter 2.

The software Process. Methodologies

**Introduction to Azure
DevOps. Tool Support for Agile
Software Development**

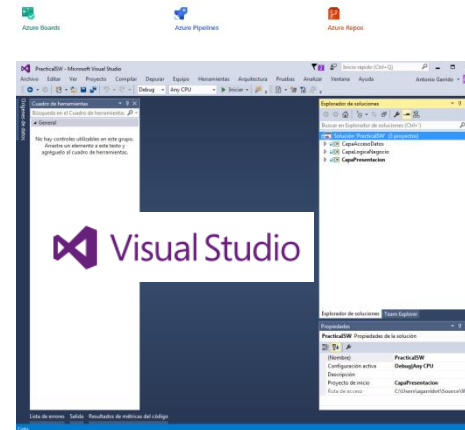
Goals

- Apply agile methodology to software development using DevOps (cloud collaboration tool for development teams) and Microsoft Visual Studio

Part 1. Project management with Azure DevOps



Utilice todos los servicios de DevOps o elija solo lo que necesita para complementar sus flujos de trabajo actuales



Part 2. Visual Studio Project development (Seminar 2)

Part 1. Project Management (Web)

- Elaborate a project plan applying an agile methodology using DevOps

Steps:

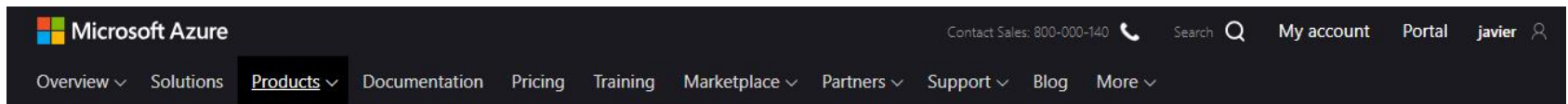
- ✓ Creating an Azure DevOps Organization
- ✓ Creating a new project
- ✓ Adding members to the team
- ✓ Work management

✓ Creating a DevOps account

Starting from the Visual Studio Web:

<https://azure.microsoft.com/en-us/services/devops/>

<https://azure.microsoft.com/es-es/services/devops/>



Azure DevOps

Plan smarter, collaborate better,
and ship faster with a set of
modern dev services.

Start free

Already have an account?

Sign in to Azure DevOps >

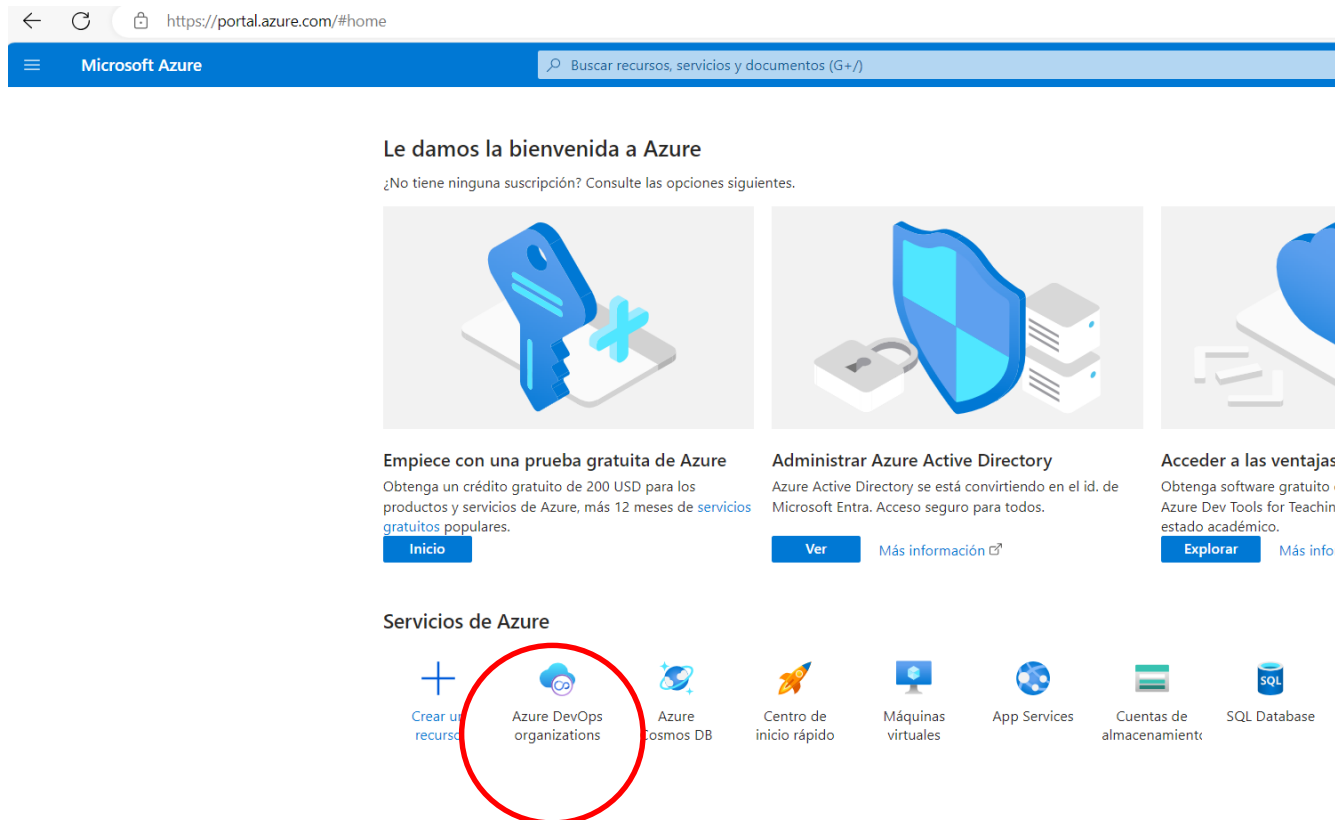
1



Acces DevOps

From Azure portal:

<https://portal.azure.com/#home>




← ↻ 🔒 https://portal.azure.com/#home


Microsoft Azure 🔍 Buscar recursos, servicios y documentos (G+/I)

Le damos la bienvenida a Azure


¿No tiene ninguna suscripción? Consulte las opciones siguientes.



Empiece con una prueba gratuita de Azure
Obtenga un crédito gratuito de 200 USD para los productos y servicios de Azure, más 12 meses de [servicios gratuitos populares](#).
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Administrar Azure Active Directory
Azure Active Directory se está convirtiendo en el id. de Microsoft Entra. Acceso seguro para todos.
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Acceder a las ventajas
Obtenga software gratuito o Azure Dev Tools for Teaching estado académico.
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Servicios de Azure




[Crear un recurso](#)




Azure DevOps organizations




Azure Cosmos DB




Centro de inicio rápido




Máquinas virtuales



App Services



Cuentas de almacenamiento

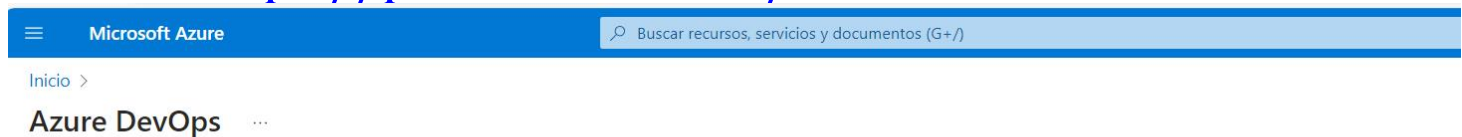


SQL Database

Access DevOps

From Azure portal:

<https://portal.azure.com/#home>



We've made it easier to manage Azure DevOps billing and subscriptions. You can [set up billing](#), [change your subscription](#) or [pay for more users and resources](#) within Azure DevOps. [Learn more](#)

Azure DevOps

Plan smarter, collaborate better, and ship faster with a set of modern dev services

My Azure DevOps Organizations

1

Get started using Azure DevOps
Billing management for Azure DevOps



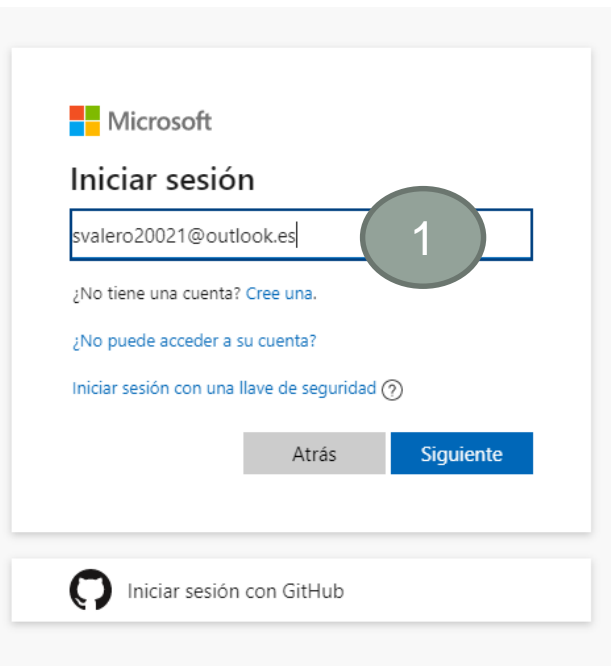
Creating a DevOps Organization

1. Log in with a upv.edu account

- Be aware that you belong to an organization and all members in the team will be forced to use a upv.edu account. Otherwise the system does not work properly

2. An organization is created with your user name by default.

- An organization is a team developing software projects in ISW



Microsoft


Iniciar sesión

¿No tiene una cuenta? [Cree una.](#)

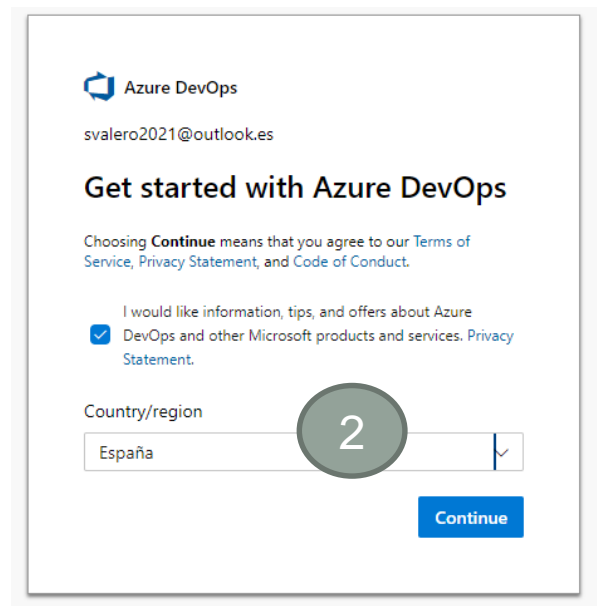
¿No puede acceder a su cuenta?

[Iniciar sesión con una llave de seguridad](#)

[Atrás](#) [Siguiente](#)

 Iniciar sesión con GitHub

A circular callout with the number 1 is positioned over the email input field.



Azure DevOps

svalero2021@outlook.es

Get started with Azure DevOps

Choosing **Continue** means that you agree to our [Terms of Service](#), [Privacy Statement](#), and [Code of Conduct](#).

☒ I would like information, tips, and offers about Azure DevOps and other Microsoft products and services. [Privacy Statement.](#)

Country/region

[Continue](#)

A circular callout with the number 2 is positioned over the country/region dropdown menu.



Azure DevOps

svalero2021@outlook.es

Taking you to your Azure DevOps organization...

[Continue](#)

A circular callout with the number 3 is positioned over the bottom right corner of the screen.

Modifying a DevOps Organization Name

- We are going to **change the default organization name**, with another team name

Azure DevOps

svalero2021

New organization

Azure DevOps will test a new networking configuration for two hours between September 9, 2020 and Sep 15, 2020. While most of the features will continue to work during this period, a small number of features may be impacted. We apologize for the inconvenience and thank you.

Create a project to get started

Project name *

Visibility

Public

Anyone on the internet can view the project. Certain features like TFVC are not supported.

Private

Only people you give access to will be able to view this project.

+ Create project

Organization settings

1

Modifying a DevOps Organization Name

- The name of our team will be a combination that includes the course name and the laboratory group name in which you are enrolled. E.g.: 2024-upv-isw-3el1-team01 (each lab team has a different number see excel sheet)

The screenshot shows the 'Overview' tab of the 'Organization Settings' page for the organization 'svalero2021'. The 'Name' field is highlighted with a red circle and the number '2', containing the text '2020-upv-isw-3dl1-equip060'. To the right of the name field is a red square logo with a white letter 'S'. Below the name field, there are sections for 'Privacy URL', 'Description', 'Time zone' (set to UTC), and 'Region' (set to West Europe). At the bottom, the 'Organization owner' is listed as 'Sole Valero' with email 'svalero2021@outlook.es'. A 'Save' button is visible at the bottom of the settings page.

The screenshot shows a 'Change organization name' dialog box. It contains the following text: 'Changing your organization name has several side effects. Please read the following before you proceed. Save all your work and ensure that nobody is using the service. The existing organization URL https://dev.azure.com/svalero2021/ will not be redirected. Workspaces and connection strings will need to be updated to point to the new URL. Learn more'. Below this, it shows 'Current name: svalero2021' and a field for 'Retype new organization name' which is highlighted with a red circle and the number '3', containing the text '2020-upv-isw-3dl1-equip060'. There is a checkbox labeled 'I understand the consequences of renaming this organization.' which is checked. At the bottom right are 'Cancel' and 'Save' buttons.

Modifying a DevOps Organization

- At this point an organization server on the cloud is available for our organization:
<https://dev.azure.com/2024-upv-isw-3el1-team01/>

Azure DevOps

2021-upv-isw-3dl1-equip060 / Settings / Overview

Azure DevOps will test a new networking configuration for two hours between September 9, 2020 and Sep 15, 2020. While most of the featur

Organization Settings

2020-upv-isw-3dl1-equip060

Search Settings

General

- Overview
- Projects
- Users
- Billing
- Auditing
- Global notifications
- Usage
- Extensions
- Azure Active Directory

Security

- Policies
- Permissions

Boards

- Process

Pipelines

- Agent pools
- Settings
- Deployment pools

Overview

Name

2020-upv-isw-3dl1-equip060

☒ Use the new URL: <https://dev.azure.com/2020-upv-isw-3dl1-equip060/>

[Learn more about URLs](#)

Privacy URL

[Learn more about the Privacy URL](#)

Description

Time zone

UTC

Region

West Europe

[Learn more about the Region](#)

Save

Changes made will affect all projects and members of the organization

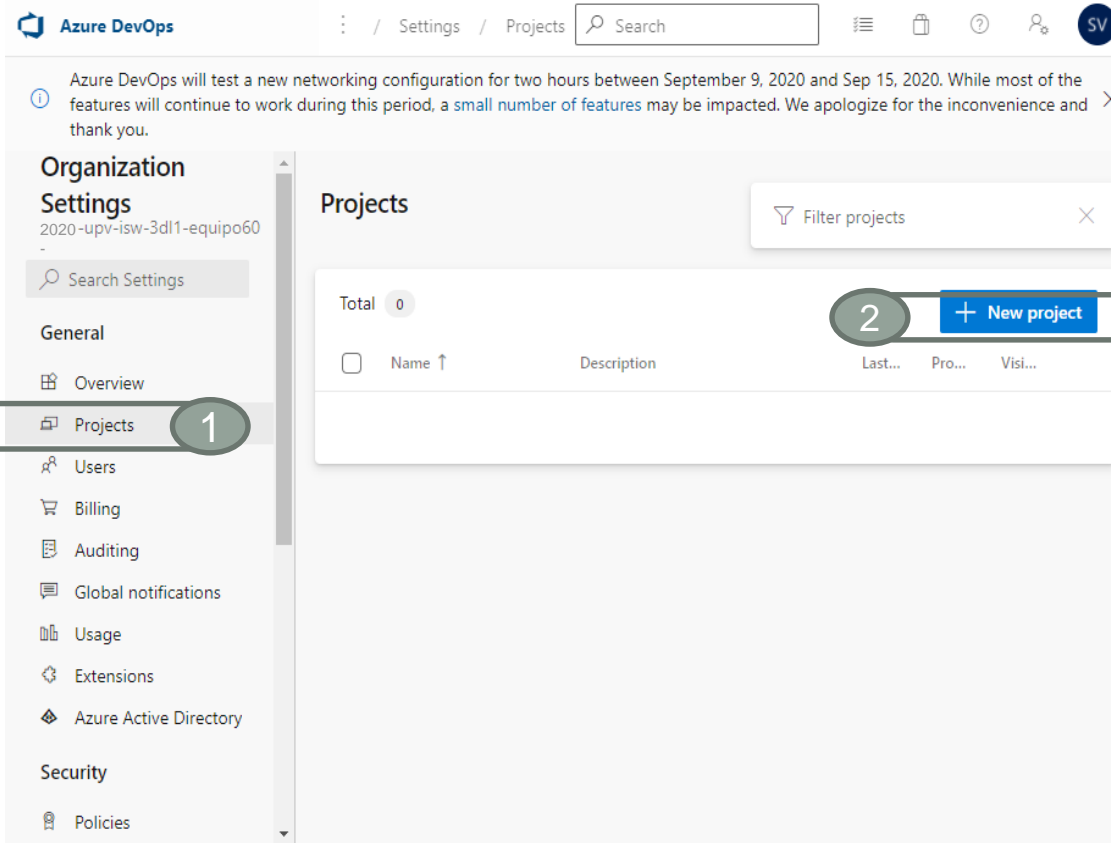
Organization owner

Sole Valero
svalero2021@outlook.es

[Learn more about the organization owner](#)

Change owner

Creating a new project



- a) We create a new project
- b) Insert a name and define visibility (private)
- c) Unfold advanced features
- d) Select git for control versioning and Agile as methodology
- e) Confirm the creation of the project

Creating a new project

The screenshot shows a 'Create new project' dialog box with the following elements and annotations:

- Project name ***: A text input field containing 'projectoISW'. A green checkmark is visible to the right. A circle with the number '1' is placed over the input field.
- Description**: An empty text area.
- Visibility**: Two radio button options are shown:
 - Public**: Represented by a globe icon. Description: 'Anyone on the internet can view the project. Certain features like TFVC are not supported.'
 - Private**: Represented by a lock icon. Description: 'Only people you give access to will be able to view this project.' A circle with the number '2' is placed over this option, and a line connects it to the 'Advanced' button.
- Advanced**: A button at the bottom right, preceded by a circle with the number '3'.

- a) We create a new project
- b) Insert a name and define visibility (private)
- c) Unfold advanced features
- d) Select git for control versioning and Agile as methodology
- e) Confirm the creation of the project

Creating a new project

Create new project

Project name *

projectolSW

Description

Visibility

Public

Anyone on the internet can view the project. Certain features like TFVC are not supported.

Private

Only people you give access to will be able to view this project.

Advanced

Version control ②

Git 1

Work item process ③

Agile 2

Cancel

Create 3

- We create a new project
- Insert a name and define visibility (private)
- Unfold advanced features
- Select git for control versioning and Agile as methodology
- Confirm the creation of the project

Azure DevOps

/ Settings / Projects

Search

Azure DevOps will test a new networking configuration for two hours between September 9, 2020 and Sep 15, 2020. While most of the features will continue to work during this period, a small number of features may be impacted. We apologize for the inconvenience and thank you.

Organization Settings

2021-upl-sw-3dl1-equip060

Search Settings

General

Overview

Projects

Users

Billing

Auditing

Projects

Filter projects

Total 1

+ New project

	Name ↑	Description	Last Updated	Process	Visibility
<input type="checkbox"/>	projectolSW	4	8/9/2020	Agile	Private

Project View

The screenshot displays the Azure DevOps web interface. At the top, the navigation bar shows 'Azure DevOps' with a search bar and user profile 'SV'. A circular callout '1' highlights the 'Settings' link in the breadcrumb navigation. Below the navigation bar, a notification banner states: 'Azure DevOps will test a new networking configuration for two hours between September 9, 2020 and Sep 15, 2020. While most of the features will continue to work during this period, a small number of features may be impacted. We apologize for the inconvenience and thank you.'

The left sidebar contains the 'Organization Settings' section for '2020-upv-isw-3dl1-equip060'. The 'General' section is active, showing a 'Search Settings' bar and a list of settings: Overview, Projects, Users, Billing, and Auditing. The 'Projects' section is highlighted.

The main content area shows the 'Projects' list for the selected organization. A circular callout '1' highlights the 'Total 1' count. The list contains one project: 'projectoISW', which is 'Agile' and 'Private'. A '+ New project' button is visible in the top right of the list.

Below the first screenshot, a second screenshot shows the '2021-upv-isw-3dl1-equip060' organization page. The left sidebar shows 'New organization' and the '2021-upv-isw-3dl1-equip060' organization is selected. The main content area shows the '2021-upv-isw-3dl1-equip060' organization page with a '+ New project' button. The 'Projects' tab is active, showing a list of projects. A circular callout '2' highlights the 'projectoISW' project, which is marked with a green 'P' icon.

Project Main View

The screenshot displays the Azure DevOps interface for a project named 'SoftwareProject01'. The interface is divided into several sections:

- Navigation Panel (Left):** A vertical sidebar containing links to various project components: Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines, Test Plans, and Artifacts. At the bottom is a 'Project settings' link with a gear icon.
- Projects List (Top Left):** A small header area showing the project name 'SoftwareProject01' and a plus icon to add more projects.
- Project Header (Top):** Displays the project name 'SoftwareProject01' and its status as 'Private'. An 'Invite' button with a plus icon is visible, used for adding members.
- Main Content Area:**
 - Welcome to the project!:** A large section with an illustration of a person working at a desk with a dog. Below the illustration, it asks 'What service would you like to start with?' and lists options: 'Work', 'Code', and 'Build and release'.
 - Project stats:** A section on the right showing a graph icon and the message: 'No stats are available at this moment. Setup a service to see project activity.'

Red arrows point from text labels to specific UI elements: 'Projects List' points to the top left header; 'Adding Members to Project' points to the 'Invite' button; 'Navigation Panel' points to the left sidebar; and 'Project settings' points to the gear icon at the bottom left.

Repository Configuration

Azure DevOps will test a new networking configuration for two hours between September 9, 2020 and Sep 15, 2020. While most of the features will continue to work during this period, a small number of features may be impacted. We apologize for the inconvenience and thank you.

proyectoISW is empty. Add some code.

Clone to your computer

HTTPS SSH `https://2020-upv-isw-3dl1-equip60@dev.azure.com/2020-upv-isw-` OR **Clone in VS Code**

Generate Git Credentials

Having problems authenticating in Git? Be sure to get the latest version [Git for Windows](#) or our plugins for [IntelliJ](#), [Eclipse](#), [Android Studio](#) or [Windows command line](#).

Push an existing repository from command line

HTTPS SSH

```
git remote add origin https://2020-upv-isw-3dl1-equip60@dev.azure.com/2020-upv-isw-3dl1-equip60/proyectoISW/_git/proyectoISW
```

Import a repository

Import

Initialize master branch with a README or gitignore

☒ Add a README **2** Add a .gitignore: VisualStudio **3** **Initialize**

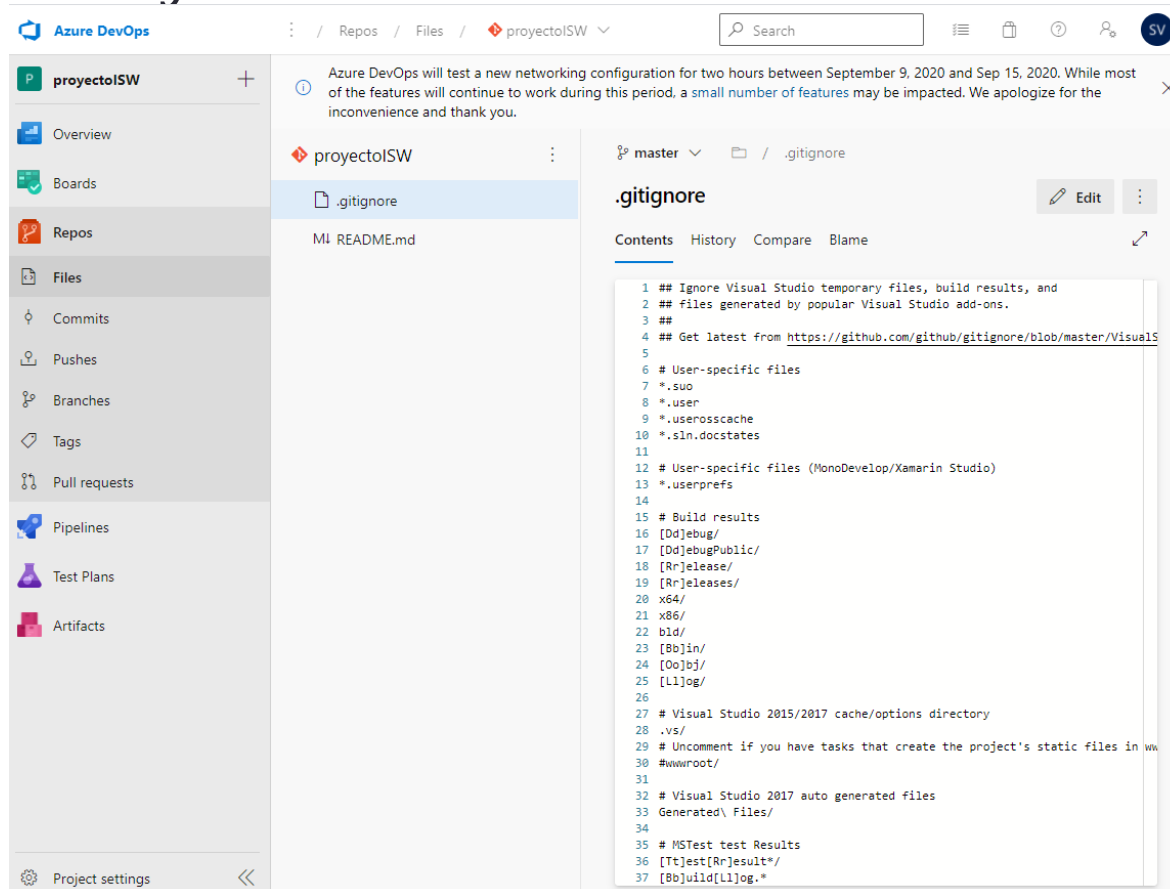
Project settings <<

We initialize the git repository to adequately work with Visual Studio:

1. Select *Repos*
2. Select VisualStudio in the *Add a .gitignore section*
3. Select *Initialize*

Repository Configuration

- A .gitignore and README.md files are created by default.



✓ Adding members to the team

Azure DevOps

2018-upv-isw-3E1-team01 / SoftwareProject01 / Overview / Summary

SoftwareProject01

Private Invite

Add Users to SoftwareProject01

Add users or groups *

Search users

Add to team(s) *

SoftwareProject01 Team

Add Cancel

Up to 5 team members may be added to your Project (free basic configuration)

Enter their sign-in addresses or display names, one at a time or all at the same time. Each team member gets an invitation email

NOTE: the email address must be associated to a upv.edu account

Project settings

Adding Members to the team

- Make sure all members have Basic access Level

What's new

Sprint 191 release notes

We've added support for environment variables in Linux scale set agents. Check out the release notes for details.

Organization settings

Export users

General

Overview

Projects

Users

Billing

Auditing

Global notifications

Usage

Extensions

Azure Active Directory

Security



Filter users

Access Level AAD User Type

Total 2

Summary

Add users

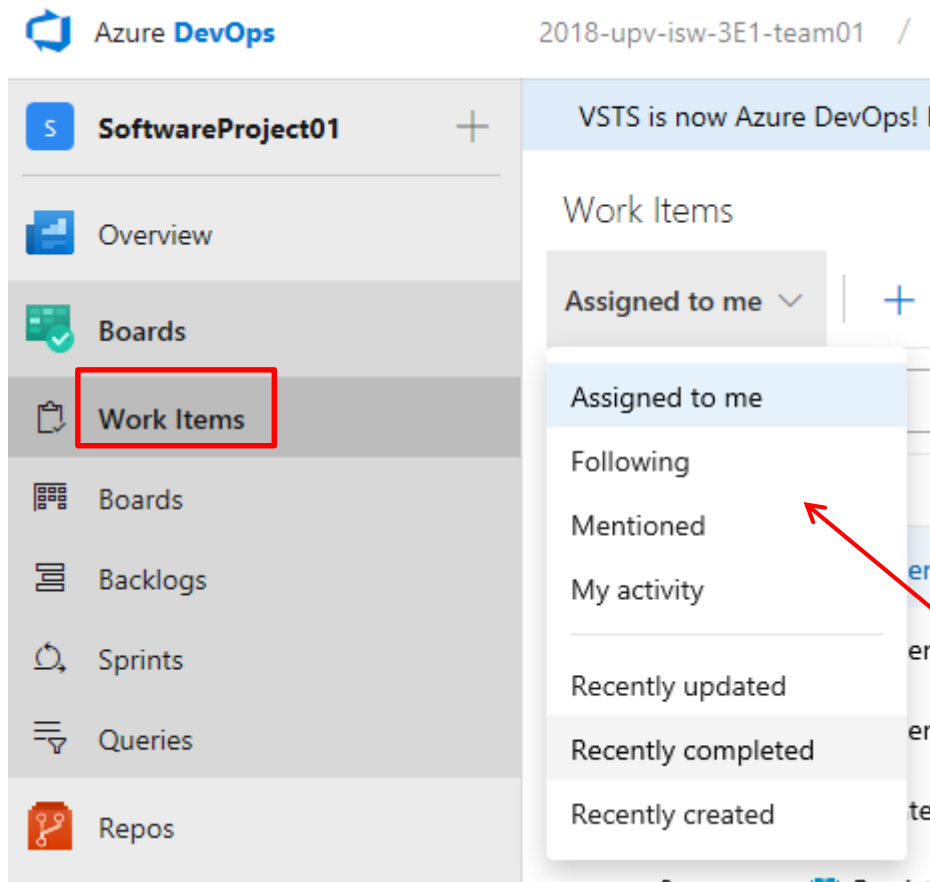
<input type="checkbox"/>	Name ↑	Access Level	Date Added	Last Accessed
<input type="checkbox"/>	 Francisco Javier Jaén Martínez fjaen@upv.edu.es	Basic	2/9/2021	13/9/2021
<input type="checkbox"/>	 JORGE MONTANER MARCO jormonm5@upv.edu.es	Stakeholder	13/9/2021	Never

Change access level

Manage user

Resend invite

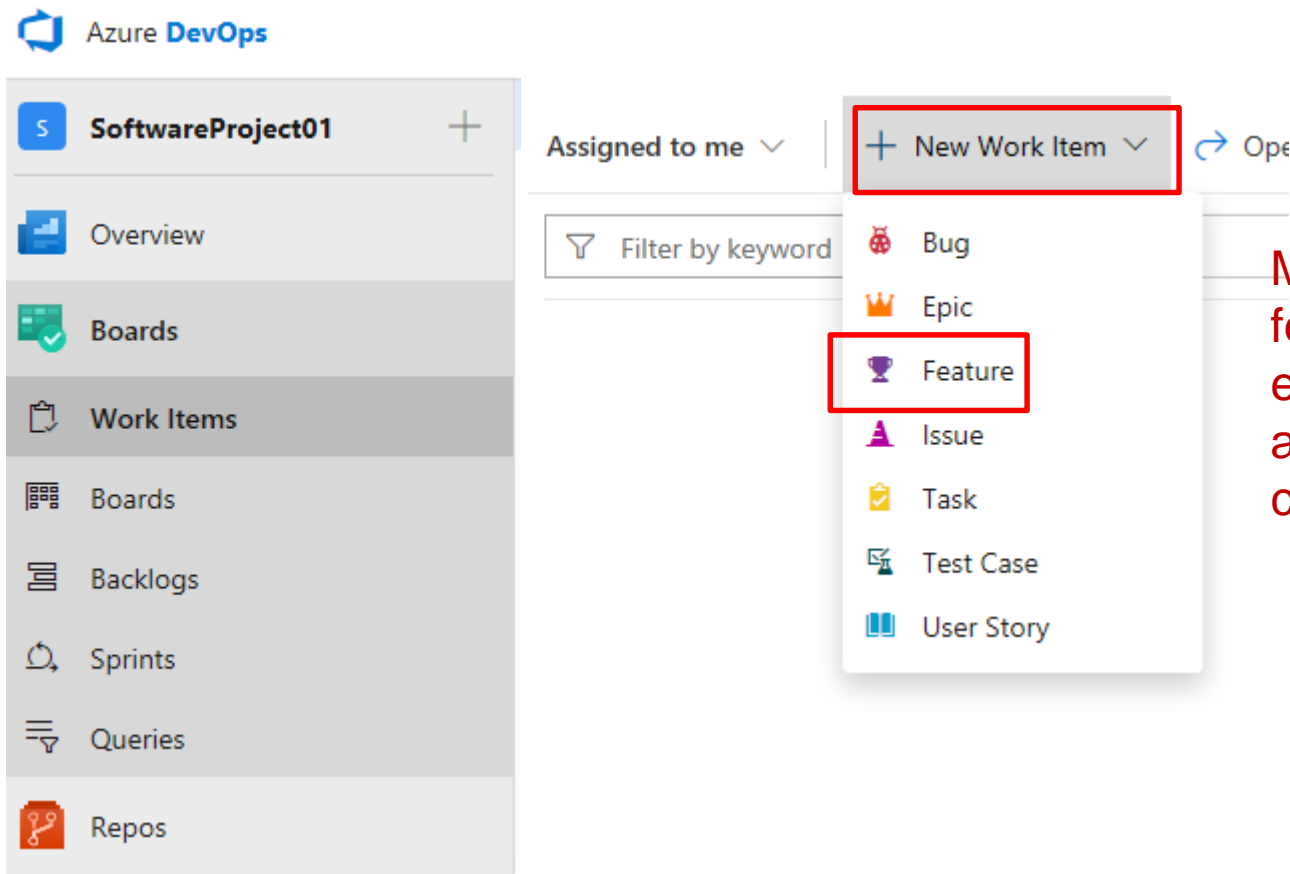
✓ Work Management (Work Items)



List of work items filtered by different criteria

Creating Work Items

Being an Agile methodology we have *sprints*, *features*, *user stories*, *tasks* (inside user stories), etc.





Many developers consider features and user stories equivalent but a feature can also be considered a collection of user stories

Creating Work Items


FEATURE 1


1 Renting Vehicle Functionality

 Javier Jaén

 0 comments

Add tag

 Save

 Follow








State  Active Area 2018-upv-isw-3E1-teacher01

Updated by iswteacher2018 2 hours ago

Reason  Implementation started Iteration 2018-upv-isw-3E1-teacher01\Iteration 1

Details




 (3)



Description

B *I* U      

Discussion

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

Planning

Priority

2

Risk

Effort

Business Value

Time Criticality

Start Date

Target Date

Development




+ Add link

Development hasn't started on this item.
[Create a new branch](#)




Related Work

+ Add link

Child (3)

  2 Display Available Vehicles
Updated an hour ago,  Active

  4 New Rental
Updated 2 hours ago,  Active

  3 View Vehicle Features
Updated an hour ago,  New

✓ Work Management (Boards)

Items can also be created on the board directly

Selection of Type of Board
There are boards to display features or stories

Drag & Drop items to change status Active<->Resolved<-> Closed

Your board consists of a list of work items. You use work items to share information, assign work to team members, track dependencies, organize work, etc.

Work Management (Boards)

User Stories can be added to a Feature directly on the board

The screenshot displays the Azure DevOps interface for a project named 'SoftwareProject01'. The left sidebar shows the navigation menu with 'Boards' selected. The main area shows the 'Features backlog' board with columns: New, Active (1/5), Resolved (0/5), and Closed. A feature item 'Renting Vehicle Functionality' by Javier Jaén is highlighted in the 'Active' column. A context menu is open over this feature, showing a '+ Add User Story' button, which is pointed to by a red arrow from the text above. The 'Features' dropdown menu in the top right is also highlighted with a red box.

Work Management (Backlogs)

Backlogs can be used to assign work items to Iterations using Drag and Drop

The screenshot displays the Azure DevOps interface for a project named 'SoftwareProject01'. The left sidebar shows the navigation menu with 'Backlogs' highlighted. The main area shows the '2018-upv-isw-3E1-teacher01 Team' backlog. A table lists work items, including three user stories and three tasks. A red arrow indicates the drag-and-drop action from the third user story, 'Display Available Vehicles', to the 'Iteration 1' section of the 'Planning' pane on the right. The 'Planning' pane shows a 'Backlog' and a list of iterations, with 'Iteration 1' marked as 'Current'. A red arrow points to the 'Iterations list' at the bottom right.

Order	Work Item Type	Title
1	User Story	View Vehicle Features
2	User Story	New Rental
3	User Story	Display Available Vehicles
	Task	Create DB Connection
	Task	Access Vehicles Table
	Task	Display Available Vehicles UI

Planning
Drag and drop work items to include them in a sprint.

Backlog 2018-upv-isw-3E1-teacher01

Iteration 1 **Current**
Planned Effort: -
3 3

Iteration 2
No work scheduled yet

Iterations list

Work Management (Sprints)

Tasks can be added to User stories directly

The screenshot displays the Azure DevOps interface for a project named 'SoftwareProject01'. The left sidebar shows navigation options: Overview, Boards, Work Items, Boards, Backlogs, Sprints (highlighted with a red box), Queries, and Repos. The main area shows the 'Sprints' view for the team '2018-upv-isw-3E1-teacher01'. The board is organized into three columns: New, Active, and Closed. A red arrow points from the text 'Tasks can be added to User stories directly' to a '+' icon in the 'New' column next to the 'View Vehicle Features' user story. The 'Active' column contains two tasks: 'Access Vehicles Table' and 'Display Available Vehicles UI'. The 'Closed' column contains one task: 'Create DB Connection'.

Column	Item	State
New	View Vehicle Features	New
	New Rental	Active
	Display Available Vehicles	Active
Active	Access Vehicles Table	Active
	Display Available Vehicles UI	Active
Closed	Create DB Connection	Closed

Sprints show the progress of tasks within a given sprint

✓ Work management. Workflow progression

As work progresses, team members can update the state and reassign it as needed until they are completed (closed)

The screenshot displays the Azure DevOps interface for a team named "2018-upv-isw-3E1-teacher01". The left sidebar shows the navigation menu with options like Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines, Test Plans, and Artifacts. The main area shows a Kanban board with three columns: New, Active, and Closed. The "New" column contains two work items: "View Vehicle Features" and "New Rental", both assigned to "Javier Jaén". The "Active" column contains one work item: "Display Available Vehicles UI", also assigned to "Javier Jaén". The "Closed" column contains two work items: "Create DB Connection" and "Access Vehicles Table", both assigned to "Javier Jaén". A dropdown menu is open over the "Builds" option in the sidebar, showing options like Releases*, Library, Task groups, and Deployment groups.

Azure DevOps

iswteacher2018 / 2018-upv-isw-3E1-teacher01 / Work / Sprints

SoftwareProject01

2018-upv-isw-3E1-teacher01 Team

No iteration dates
[Set dates](#)

Taskboard Backlog Capacity + New Work Item

Iteration 1

Collapse all

New Active Closed

View Vehicle Features
Javier Jaén
State New

New Rental
Javier Jaén
State Active

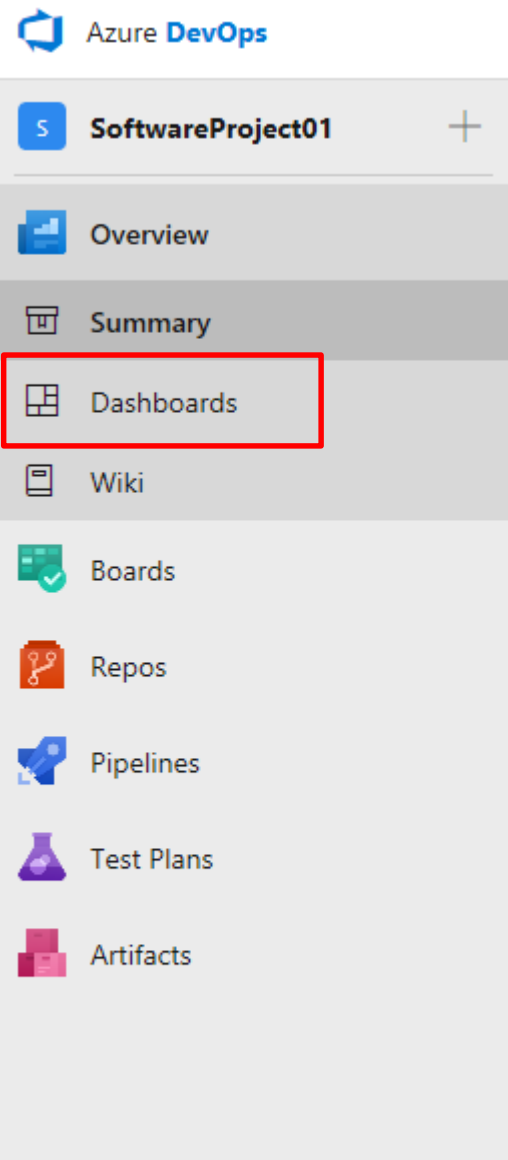
Builds
Releases*
Library
Task groups
Deployment groups

Display Available Vehicles UI
Javier Jaén

Create DB Connection
Javier Jaén

Access Vehicles Table
Javier Jaén

✓ Dashboards



This dashboard doesn't have widgets just yet!

Add one or more widgets to gain visibility into your team's progress.

[Add a widget](#)

You can configure your own personalized dashboard by adding widgets with the reporting information you are interested in

✓ Dashboards

Add, edit, move or resize your widgets

Done Editing

Add Widget



Chart for Test Plans

Create charts for test case authoring and test case execution status for test plans and test suites



Chart for Work Items

Visualize work items like bugs, user stories, and features using shared work item queries.



Code Tile

Displays the number of recent changes in

Don't see a widget? Explore the [Extension Gallery](#)

Add

Project Settings

- Permissions, notifications, repositories, etc. may be configured

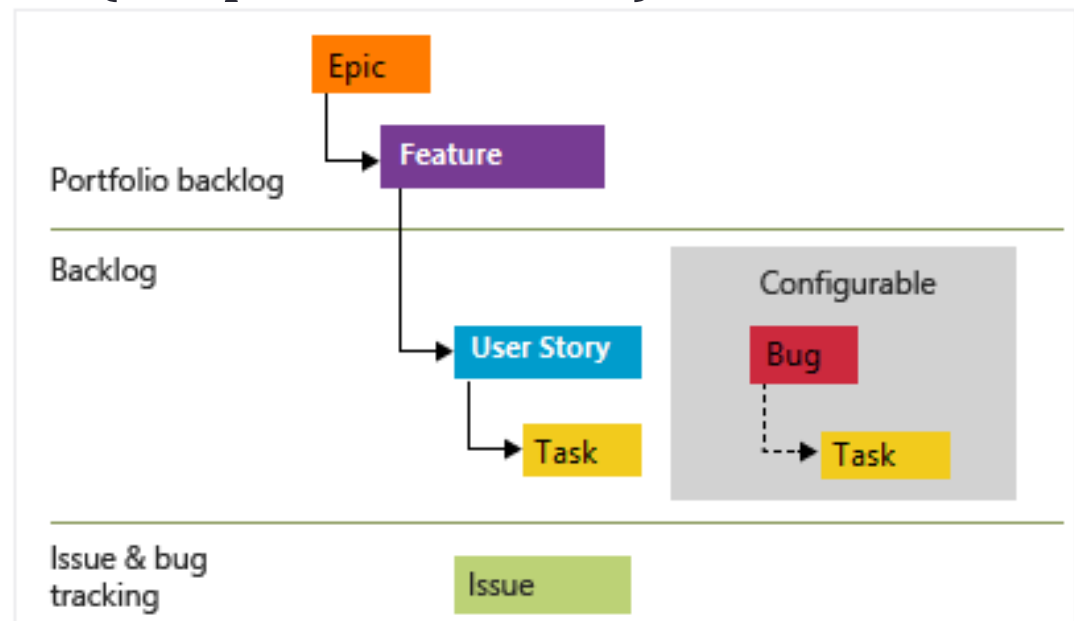
The screenshot shows the Azure DevOps interface for a project named 'projectoISW'. The left sidebar contains navigation links: Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines, Test Plans, and Artifacts. The main content area displays the 'Overview' tab, which includes a notification about a networking configuration test, a section for adding a project description, and project statistics for the last 7 days. The statistics show 2 work items created, 0 work items completed, 0 pull requests opened, and 1 commit by 1 author. A 'Members' section shows 1 member. A large grey arrow points from the main content area to a detailed 'Project Settings' sidebar on the right. This sidebar lists various settings categories: General, Overview, Teams, Permissions, Notifications, Service hooks, Dashboards, Boards, Project configuration, Team configuration, GitHub connections, Pipelines, Agent pools, Parallel jobs, Settings, Test management, Release retention, Service connections, XAML build services, Repos, Repositories, Test, and Retention. A small '1' in a circle is located in the bottom left corner of the image.

Project Settings

- General
- Overview
- Teams
- Permissions
- Notifications
- Service hooks
- Dashboards
- Boards
- Project configuration
- Team configuration
- GitHub connections
- Pipelines
- Agent pools
- Parallel jobs
- Settings
- Test management
- Release retention
- Service connections
- XAML build services
- Repos
- Repositories
- Test
- Retention

Task

- Create an Azure DevOps organization (your lab organization name in the registration excel file), a Scrum project ISWLabProject and add all lab team members and myself (fjaen@upv.edu.es) as members with “Basic” access level
- DO NOT FORGET TO PERFORM THE CODE REPOSITORY CONFIGURATION STEP (see previous slides)
- define example sprints, tasks, etc.



Epics, Features

- An epic represents a business initiative to be accomplished
 - Increase customer engagement
 - Improve and simplify the user experience
 - Implement new architecture to improve performance
 - Engineer the application to support future growth
 - Support integration with external services
 - Support mobile apps
- A feature typically represents a shippable component of software.
 - Add view options to the new work hub
 - Add mobile shopping cart
 - Support text alerts
 - Refresh the web portal with new look and feel

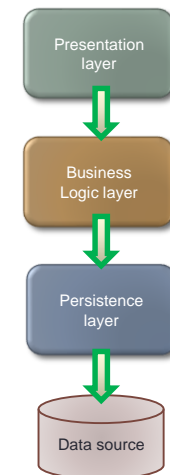
✓ Task: Define Sprint

Create a sprint with the following features and tasks

SoftwareProject01 Team ▾ ☆ ⌘

Backlog Analytics | + New Work Item ⌕ View as Board 🔑 Column Options ...

Order	Work Item Type	Title	State	Effort
1	Feature	Architectural Design Definition	New	
	User Story	Presentation Layer	Active	
	Task	Implement Visual Studio Presentation Layer	New	
	User Story	Business Logic Layer	Active	
	Task	Implement Visual Studio Business Logic layer	New	
	User Story	Persistence Layer	Active	
	Task	Implement Visual Studio Persistence Layer	New	
2	Feature	Testing Definition	New	
	User Story	Testing Project	New	
	Task	Create Testing Project	New	



Optional Tasks

- Read the DevOps documentation
 - <https://docs.microsoft.com/en-us/azure/devops/index?view=vsts>
 - <https://docs.microsoft.com/en-us/azure/devops/user-guide/index?view=vsts>

Additional Resources

- Visual Studio Walkthroughs (English)
[https://msdn.microsoft.com/es-es/library/szatc41e\(v=vs.110\).aspx](https://msdn.microsoft.com/es-es/library/szatc41e(v=vs.110).aspx)

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- [Introduction to Azure DevOps.](#)
Donovan Brown. Microsoft Visual Studio



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- [Plan Your work with Azure Boards.](#)
Ali Tai. Microsoft Visual Studio



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- [Manage and store your code in Azure Repos.](#) Edward Thomson.
Microsoft Visual Studio

