

Cloud Devops Project

Simplification of CI/CD pipeline to Azure with Azure DevOps

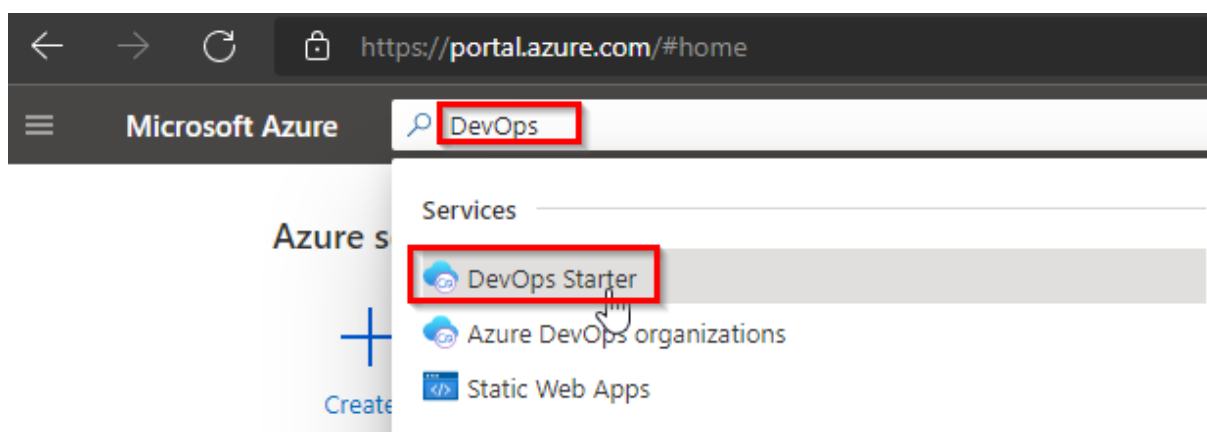
The DevOps Starter Project simplifies the setup of an entire continuous integration (CI) and continuous delivery (CD) pipeline to Azure with Azure DevOps. You can start with existing code or use one of the provided sample applications. Then you can quickly deploy that application to various Azure services such as Virtual Machines, App Service, Azure Kubernetes Services (AKS), Azure SQL Database and Azure Service Fabric. DevOps Projects does all the work for the initial configuration of a DevOps pipeline including everything from setting up the initial Git repository, configuring the CI/CD pipeline, creating an Application Insights resource for monitoring, and providing a single view of the entire solution with the creation of a DevOps Projects dashboard in the Azure portal.

In this lab, we will

- Create an ASP.NET sample DevOps project using DevOps Starter feature in Azure
- Examine the CI/CD pipelines configured by DevOps Starter
- Commit the code changes and execute CI/CD
- Configure Azure Application Insights monitoring

Step 1: Setting up a sample ASP.NET project using DevOps Starter Project

- Sign into the Microsoft Azure portal.
- In the search box, type DevOps , and then select DevOps Starter. Then click on Create DevOps Starter



DevOps Starter

Default Directory

[+ Create](#) [Manage view](#) [Refresh](#) [Export to CSV](#) [Open query](#) [Assign tags](#) [Feedback](#)

Filter for any field... [Subscription == all](#) [Resource Group Name == all](#) [Location == all](#) [Add filter](#)

Showing 0 to 0 of 0 records.

Name ↑↓

Resource... ↑↓



No DevOps starter to display

Try changing or clearing your filters.

[Create DevOps starter](#)

- By default DevOps Starter project setup with GitHub. Click on change settings here to change the destination to Azure DevOps and click Done

Home > DevOps Starter >

DevOps Starter

Create

Launch an app running in Azure in a few quick steps
Everything you need, created and ready to go: code repository, CI/CD pipeline or Github Workflow, and the necessary Azure resources.

Start fresh with a new application

Setting up DevOps starter with GitHub, change settings [here](#)

.NET New Web App using ASP.NET or ASP.NET Core, or a new IoT app	Node.js New Web app using Node.js, Express.js or Sails.js, or a new IoT app	PHP New Web app using simple PHP	Java New Web App using Spring or JSF, or a new IoT app
Static Website New static website using HTML, CSS, and JavaScript	Python New Web App using Bottle, Django, or Flask	Ruby New Web App using Ruby on Rails	Go New Web App using Go

Next: Framework >

DevOps starter settings

Azure DevOps
Build, test and deploy with your code in Azure repos and CI/CD using Azure Pipelines

GitHub
Build, test and deploy with your code in GitHub repos and CI/CD using GitHub Actions

[Done](#)

- Now select the .NET sample application and click Next.

Home > DevOps Starter >

DevOps Starter

Create

Launch an app running in Azure in a few quick steps
Everything you need, created and ready to go: code repository, CI/CD pipeline or Github Workflow, and the necessary Azure resources.

Setting up DevOps starter with GitHub, change settings [here](#)

.NET New Web App using ASP.NET or ASP.NET Core, or a new IoT app	Node.js New Web app using Node.js, Express.js or Sails.js, or a new IoT app	PHP New Web app using simple PHP	Java New Web App using Spring or JSF, or a new IoT app
Static Website New static website using HTML, CSS, and JavaScript	Python New Web App using Bottle, Django, or Flask	Ruby New Web App using Ruby on Rails	Go New Web App using Go

We are continuously adding support for more scenarios. Stay tuned!

[Next: Framework >](#)

- The .NET samples include a choice of either the open source ASP.NET framework or the cross-platform .NET Core framework. Select the .NET Core application framework. This sample is an ASP.NET Core MVC application. And also enable Add a database toggle to add the database to the application. When you're done, choose Next.

DevOps Starter ...

Create

Runtime Framework Service Create

Choose an application framework

ASP.NET

Open source web framework for building modern web apps and services

ASP.NET Core

Cross-platform, open-source framework for building modern web apps and services

Simple IoT

A fully managed service that delivers cloud intelligence locally on cross-platform IoT devices

Add a database ☒

SQL Database

A relational database-as-a service using the Microsoft SQL Server Engine

< Previous **Next: Service >**

- Web App on Windows is the default deployment target. You can optionally choose Virtual Machine also. When you're done, choose Next.

DevOps Starter ...

Create

Runtime Framework Service Create

Select an Azure service to deploy the application

Windows Web App

Fully managed compute platform on Windows for web applications and websites.

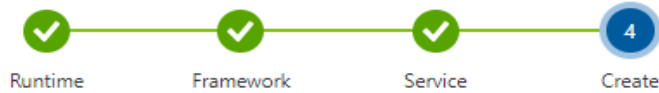
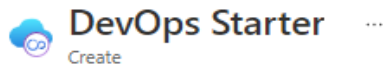
Virtual machine

Windows virtual machine to run your app

Don't see a service you're looking for? We're continuously adding support for more Azure services and app frameworks. [Learn more](#)

< Previous **Next: Create >**

- Select your Azure DevOps organization and choose a name for your project and Web app. When you're done, choose Review + Create.



Almost there!

Ready to deploy ASP.NET Core app to Azure Windows Web App, with SQL Database.

Project name *	<input type="text" value="dotnetdevops"/>	✓
Azure DevOps Organization *	<input type="text" value="AzureDevOpsDemoGen"/>	▼
Subscription * ⓘ	<input type="text" value="Visual Studio Enterprise"/>	▼
Web app name * ⓘ	<input type="text" value="dotnetdevops1234"/>	✓ .azurewebsites.net
Location ⓘ	<input type="text" value="South Central US"/>	▼

Pricing tier: S1 Standard (1 Core, 1.75 GB RAM)

[Additional settings](#)

By continuing, you agree to the [Terms of Service](#) and the [Privacy Statement](#). The new app code is published under the MIT license.

< Previous

Review + Create



Almost there!

Ready to deploy ASP.NET app to Azure Windows Web App, with SQL Database.

* Project name	<input type="text" value="dotnetdevops"/>	✓
* Azure DevOps Organization	<input type="text" value="AzureDevOpsDemoGen"/>	▼
* Subscription ⓘ	<input type="text" value="Visual Studio Enterprise"/>	▼
Web app name ⓘ	<input type="text" value="dotnetdevops2006"/>	✓ .azurewebsites.net
Location ⓘ	<input type="text" value="South Central US"/>	▼

Pricing tier: S1 Standard (1 Core, 1.75 GB RAM)

[Additional settings](#)

By continuing, you agree to the [Terms of Service](#) and the [Privacy Statement](#). The new app code is published under the MIT license.

Previous

Done

Additional settings

* Create new Azure DevOps organization

Yes

No

Your project will be hosted in selected DevOps Services organization: AzureDevOpsDemoGen

Web App on Windows

Resource group ⓘ	<input type="text" value="dotnetdevops2006-rg"/>	✓
Pricing tier ⓘ	<input type="text" value="S1 Standard (1 Core, 1.75 GB RAM)"/>	▼
Application Insights Location ⓘ	<input type="text" value="South Central US"/>	▼

Database Server Login Details

Server name ⓘ	<input type="text" value="dotnetdevops-server"/>	✓ .database.windows.net
Enter username ⓘ	<input type="text" value="dbadmin"/>	
Location ⓘ	<input type="text" value="South Central US"/>	▼
Database Name	<input type="text" value="dotnetdevops2006-db"/>	

OK

- Once the deployment completes, click Go to resource.

✓ Your deployment is complete



Deployment name: Deploy_DevOps_Project_dotnetdevops

Subscription: Visual Studio Enterprise

Resource group: VstsRG-k[redacted]-7efb

✓ Deployment details (Download)

^ Next steps

Go to resource

- DevOps project dashboard loads as shown in below image.

The screenshot displays the Azure DevOps project dashboard for 'dotnetdevops'. The top navigation bar includes links for Refresh, Project homepage, Repositories, Build pipelines, Release pipelines, Agile backlogs, Users & groups, and Delete. The main content area is divided into three sections: CI/CD pipeline, Azure resources, and Application Insights. The CI/CD pipeline section shows a 'Code' stage with a commit, a 'Build' stage that succeeded, and a 'dev' stage that is in progress. The Azure resources section shows the application endpoint, App Service, and SQL Database. The Application Insights section shows a graph of server requests.

- DevOps project
 - Created a team project with sample .NET code repository
 - Created a build and release pipelines to compile, test and deploy the application
 - Created Azure Web App and Azure SQL database in Azure using Azure Pipelines
- If Azure Resources are not created, they will be created by CI/CD pipeline. You can track pipeline status in 'CI/CD pipeline' section You're now ready to collaborate with a team on an ASP.NET Core app with a CI/CD process that automatically deploys your latest work to your web site.
- On the right side of the dashboard, select Browse to view your running application.

Azure resources

Application endpoint

<https://dotnetdevops1208.azurewebsites.net>

Browse

App Service

SQL Database

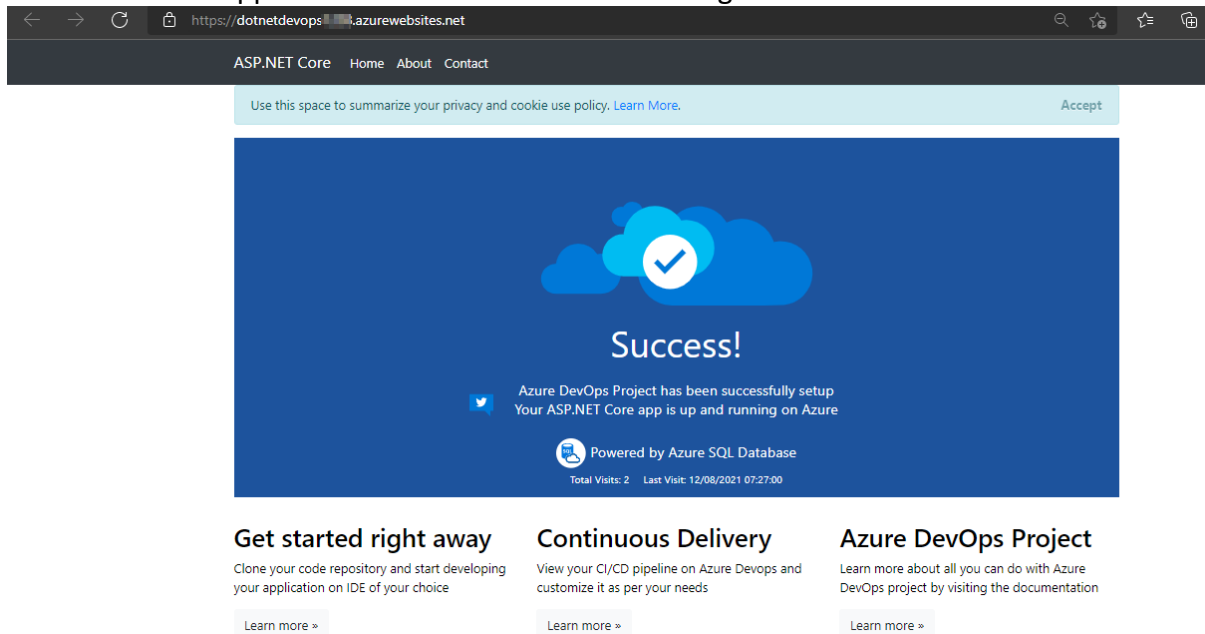


dotnetdevops1208



Running

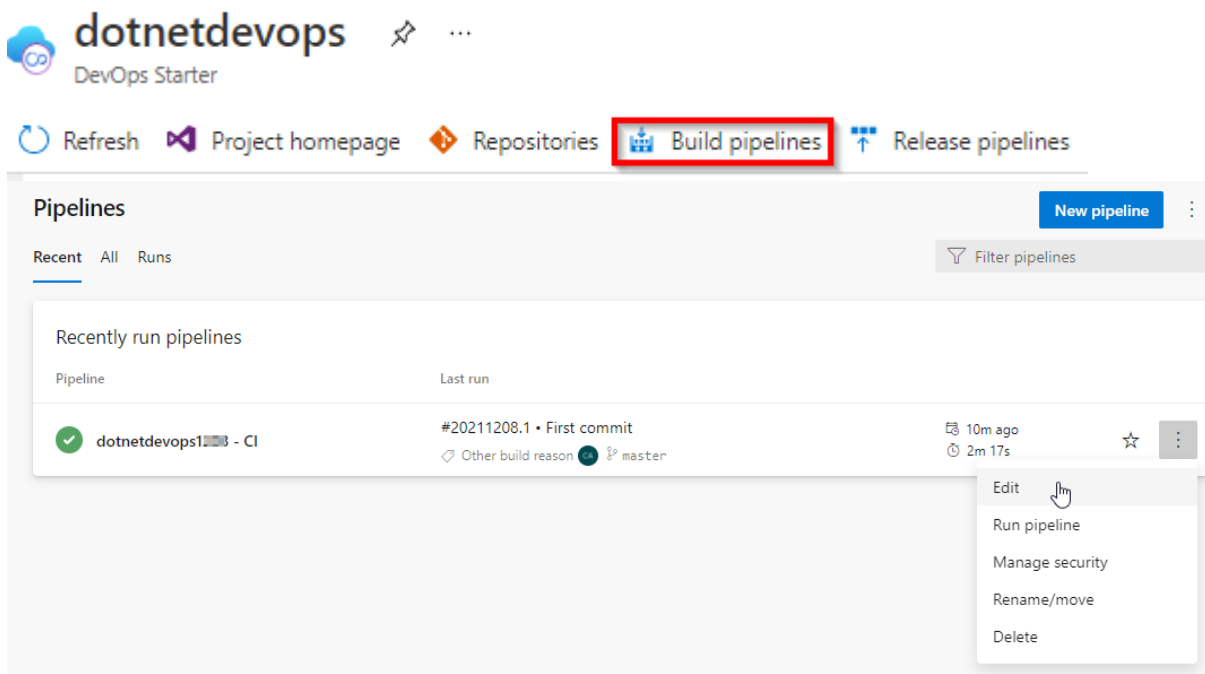
- The web app looks like as shown in the below figure



Step-2: Examine the CI/CD pipelines configured by Azure DevOps Project

The Azure DevOps Starter project automatically configured a full CI/CD pipeline in your Azure DevOps organization. You can explore and customize the pipeline as needed. Follow the steps below to familiarize yourself with the Azure DevOps build and release pipelines.

- Select Build Pipelines from the top of the Azure DevOps project dashboard. This link opens a browser tab and the Azure DevOps build pipeline for your new project.



- In this pane, you can examine the various tasks for your build pipeline. This build pipeline performs various tasks such as fetching sources from the Git repository, restoring dependencies, compile the application, run tests and publishing outputs used for deployments.

dotnetdevops1208 - CI

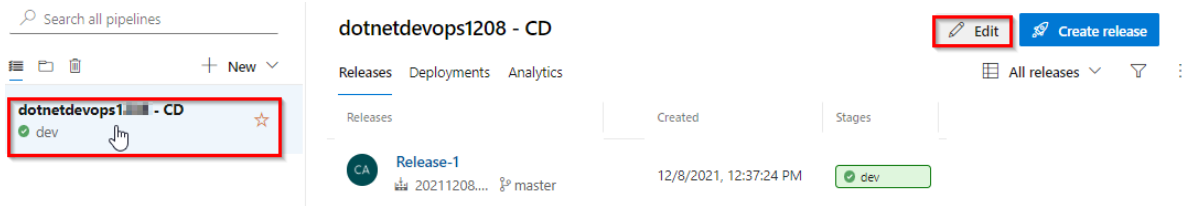
- Under your build pipeline name, select History. You see an audit trail of your recent changes for the build. Azure DevOps keeps track of any changes made to the build definition and allows you to compare versions.
- Select Triggers. The Azure DevOps project automatically created a CI trigger and every commit to the repository initiates a new build. You can optionally choose to include or exclude branches from the CI process.

dotnetdevops1208 - CI

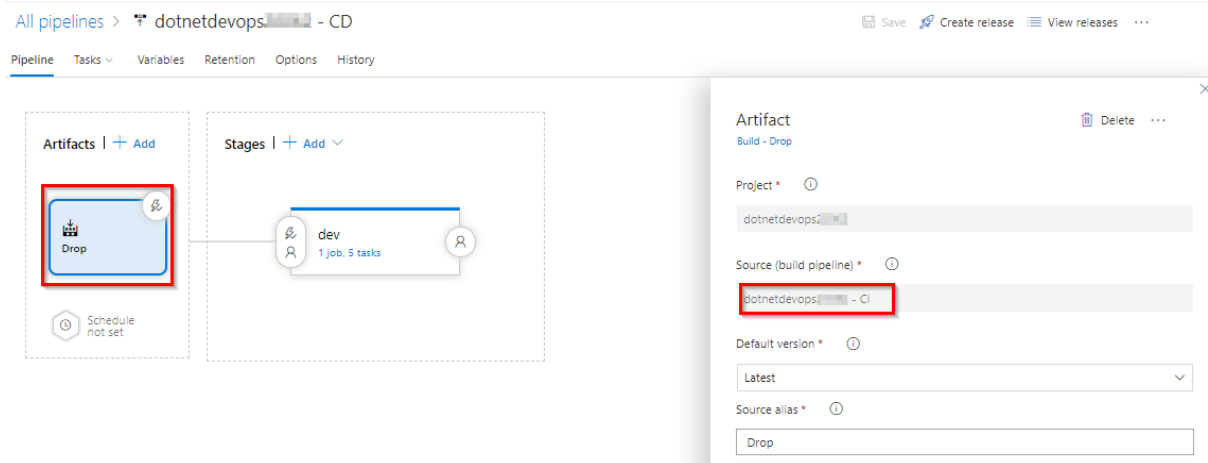
- Select Releases under Pipelines section.

The Azure DevOps project created a release pipeline to manage deployments to Azure.

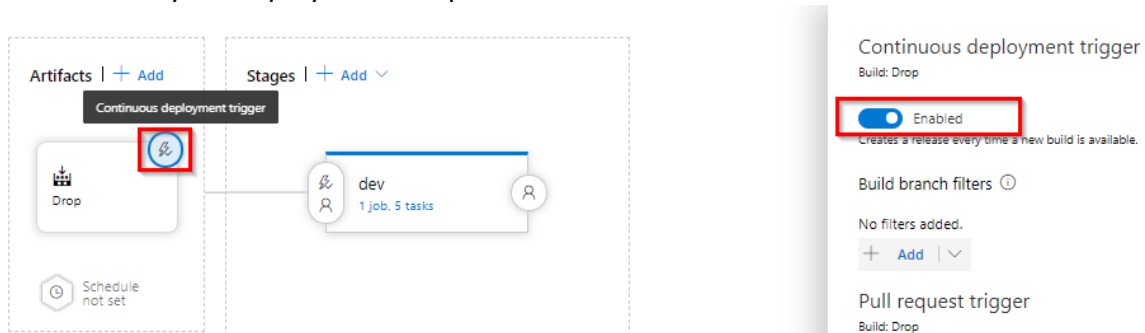
- Select the release pipeline, then choose Edit.



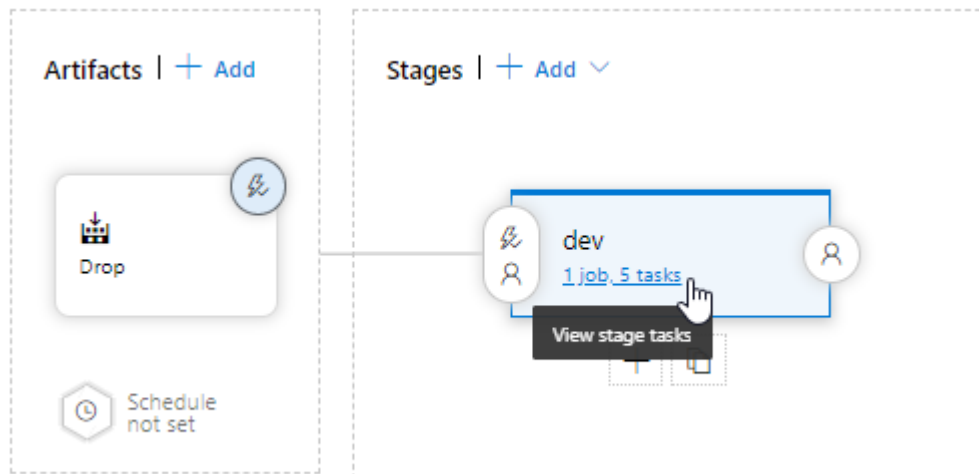
- Under Artifacts, select Drop. The build pipeline you examined in the previous steps produces the output used for the artifact.



- To the right-hand side of the Drop icon, select the Continuous deployment trigger. This release pipeline has an enabled CD trigger, which executes a deployment every time there is a new build artifact available. Optionally, you can disable the trigger, when your deployments require manual execution.



- Select Tasks. The tasks are the activities your deployment process performs. In this example, you have five tasks.
 - Azure Resource Group Deployment task deploy the required Azure resources, Azure Web app and Azure SQL database for the application to use.
 - Azure App Service Deploy task deploy the application package to the web site
 - Azure SQL Database deployment task deploy SQL changes to the database.
 - Visual Studio Test tasks run functional tests after the successful deployment of the application



Pipeline Tasks Variables Retention Options History

dev
Deployment process


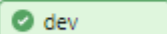
Agent phase
Run on agent

- Azure Deployment: Create Azure Resources**
Azure Resource Group Deployment
- Deploy Azure App Service**
Azure App Service Deploy
- Execute Azure SQL**
Azure SQL Database deployment
- Visual Studio Test Platform Installer**
Visual Studio Test Platform Installer
- Test Assemblies**
Visual Studio Test

- On the right-hand side of the browser, select View releases. This view shows a history of releases.

Save Create release **View releases** ...


Releases Deployments Analytics

Releases	Created	Stages
 Release-1 20190... master	6/20/2019, 11:36:15 AM	 dev



- Click on the release number to view the release summary. There are several menus to explore from this view such as a release summary, associated work items, and tests.

Pipeline Variables History | + Deploy ▾ ⏸ Cancel ↻ Refresh ✎ Edit ▾ ...


Release


Continuous deployment
for  Sriramdas Balaji
6/20/2019, 11:36 AM



Artifacts


Drop 
20190620.1
master

Stages

dev
 Succeeded
on 6/20/2019, 11:43 AM

 100%

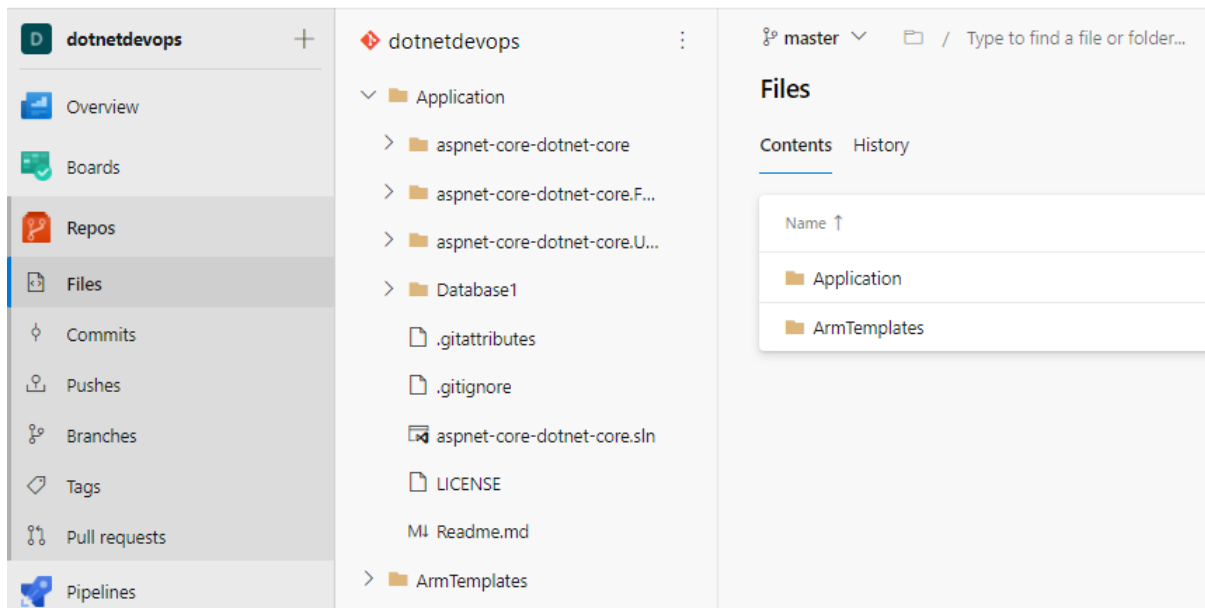
 Redeploy  Logs

- Select Logs. The logs contain useful information about the deployment process. They can be viewed both during and after deployments.

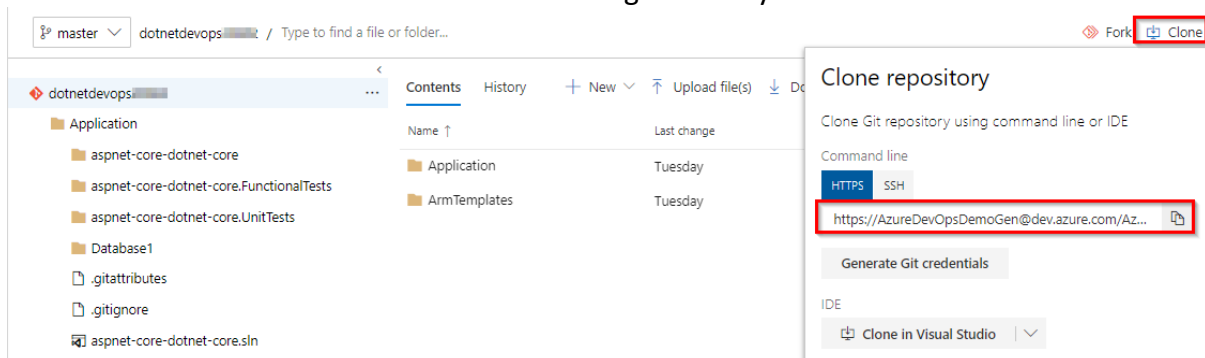
Step-3: Commit the code changes and execute CI/CD

The Azure DevOps project created a Git repository in your Azure DevOps organization. Follow the steps below to view the repository and make code changes to your application.

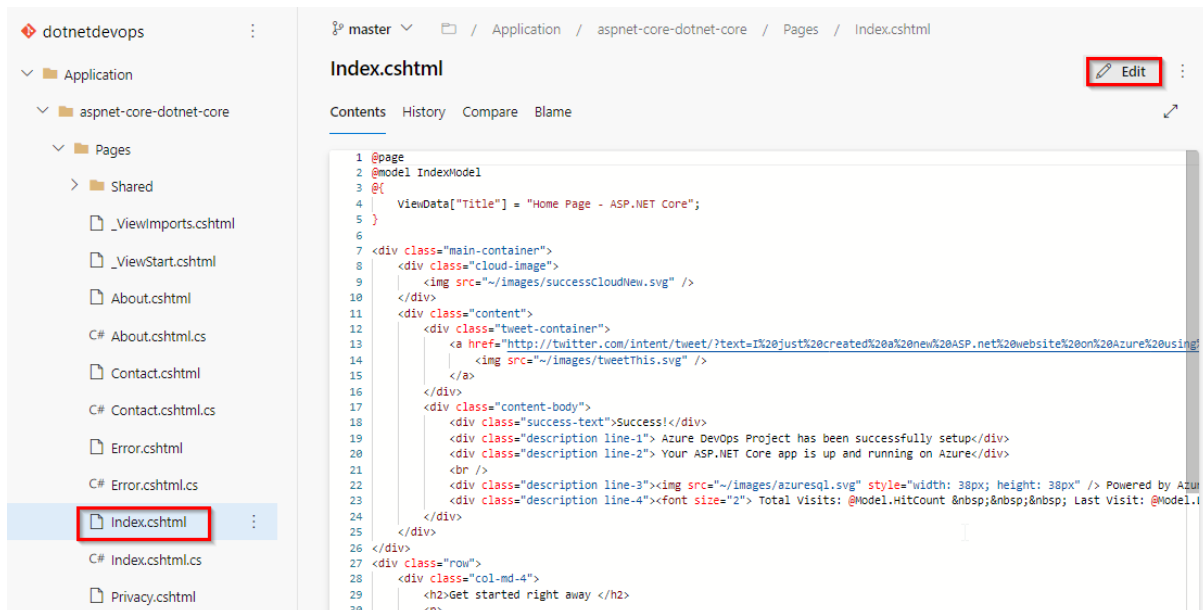
- Select Repos to view the created Git repository by Azure DevOps project.



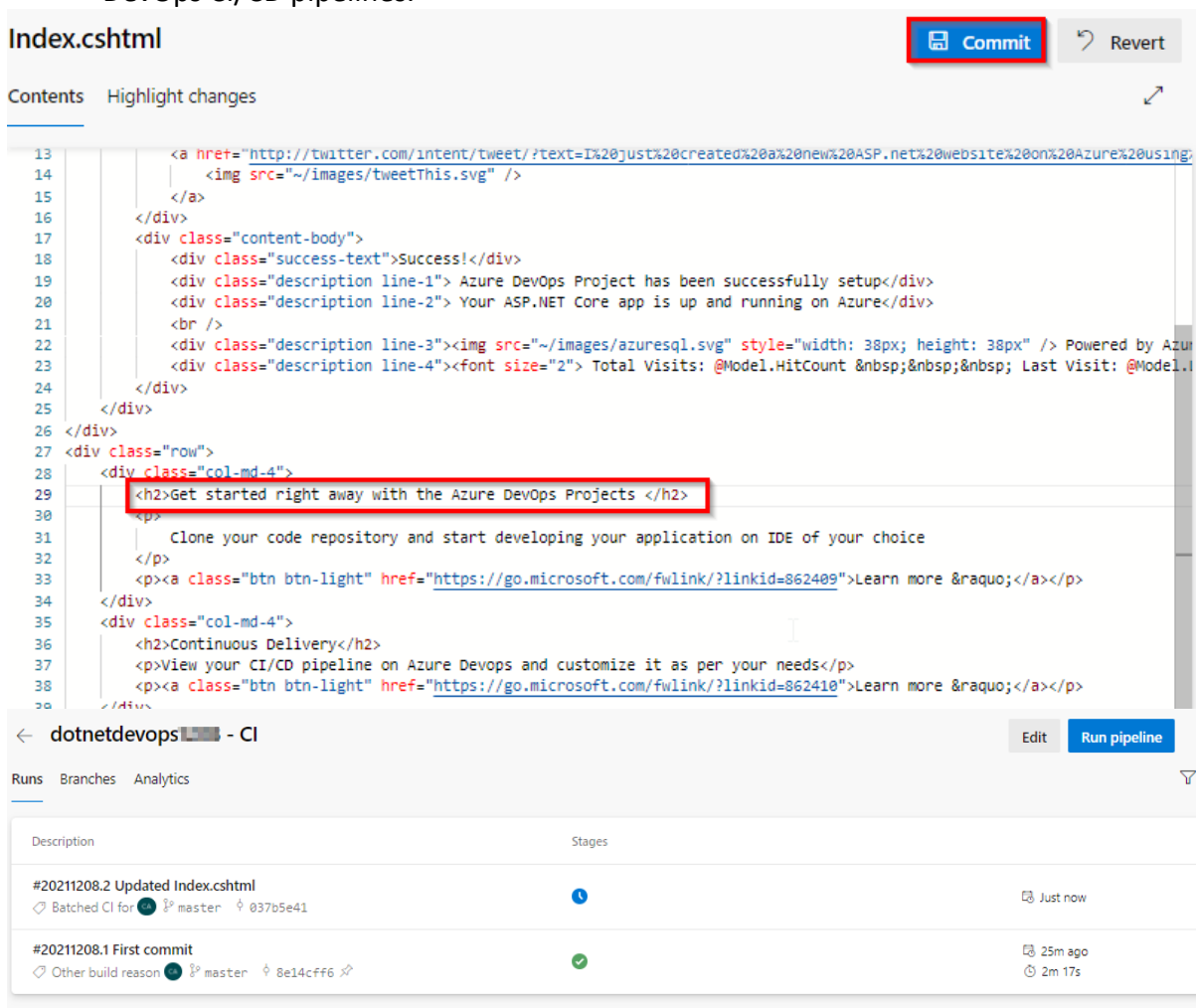
- To view the repository clone URL, select Clone from the top right of the browser. You can clone your Git repository in your favourite IDE. In this lab, you can use the web browser to make and commit code changes directly to the master branch.



- On the left-hand side of the browser, navigate to the Application/aspnet-core-dotnet-core/Pages/Index.cshtml file. Select Edit, and make a change. Make a change to the h2 heading. For example, type Get started right away with the Azure DevOps Projects or make some other change. Choose Commit, to save and check-in your changes.



- In your browser, navigate to the Pipelines | Pipelines. You should now see a build is in progress. The changes you just made are automatically built and deployed via Azure DevOps CI/CD pipelines.



- Once the Build and Release are completed in your browser, navigate to the Azure DevOps project dashboard. On the right side of the dashboard, select Browse to view your updated running application. You will see the updated header in the web app.

Azure resources

Application endpoint

<https://dotnetdevops123.azurewebsites.net>


[Browse](#)

App Service


SQL Database


 dotnetdevops123

 **Running**



Success!

 Azure DevOps Project has been successfully setup
Your ASP.NET CORE app is up and running on Azure

 Powered by Azure SQL Database

Total Visits: 5 Last Visit: 06/20/2019 07:32:04

Get started right away with the Azure DevOps Projects

Clone your code repository and start developing
your application on IDE of your choice

Continuous Delivery

View your CI/CD pipeline on Azure DevOps and
customize it as per your needs

[Learn more »](#)

Azure DevOps Project

Learn more about all you can do with Azure
DevOps project by visiting the documentation

[Learn more »](#)