

Containerize your Applications using Kubernetes (AKS) on Azure and Azure DevOps



Microsoft Azure Student TECHathon



In this lab we will create a simple python hello-world app, containerize it using Docker, the app will be deployed in an Azure Kubernetes Service (AKS) cluster using Azure DevOps

Prerequisite

- An Azure Subscription
- Install:
 - Docker
 - Azure CLI
 - Visual Studio Code (or any text editor)
 - if you are on Windows install Hyper-v or install WSL on W10
 - git

Tasks

- Setup the environment and create an Azure resource group
- Create the ACR
- Create AKS cluster
- Connect ACR with AKS cluster
- Connect to the cluster
- Create sample application and deploy it to the AKS cluster using Azure DevOps pipeline
- Test the running application
- Optional: Monitor application and cluster health
- Optional: Create a VNet

Lab Steps

Parameters

```
## ACR

ACR_Name="acrHelloWorldStudent2"

## SP

AKS_SP_NAME="spHS2"

## AKS Cluster

LOCATION="eastus"

RG_NAME="rg-aks-Hellostudent2"

CLUSTER_NAME="aks2"

NODE_SIZE="Standard_DS2_v2"

NODE_COUNT="3"

NODE_DISK_SIZE="35"

VERSION="1.17.11"

CNI_PLUGIN="kubenet"

VMSETTYPE="VirtualMachineScaleSets"

SRV_CIDR="10.3.0.0/16"

DNS_SRV="10.3.1.1"

POD_CIDR="10.244.0.0/16"

DOCKER_BRIDGE_ADDRESS="172.17.0.1/16"
```

Login to Azure

```
az login
```

Create aks cluster

```
az group create --name $RG_NAME --location $LOCATION --tags env=lab
```

Create azure container register

```
az acr create -n $ACR_Name -g $RG_NAME --sku standard
```

Create a service principal without a default assignment.

```
az ad sp create-for-rbac \
    --name $AKS_SP_NAME \
    --skip-assignment
```

Retrieve Service principal APPID and Client Secret

```
AKS_SP_APP_ID=$(az ad app list --display-name $AKS_SP_NAME --query "[] .appId" -o tsv)

AKS_SP_SECRET=$(az ad sp credential reset --name $AKS_SP_NAME --query "password" -o tsv)
```

Creat AKS Cluster

```
az aks create --resource-group $RG_NAME --name $CLUSTER_NAME \
--service-principal $AKS_SP_APP_ID \
--client-secret $AKS_SP_SECRET \
--node-count $NODE_COUNT \
--node-vm-size standard_DS2_v2 \
--location $LOCATION \
--load-balancer-sku standard \
--vm-set-type $VMSETTYPE \
--kubernetes-version $VERSION \
#--enable-addons monitoring \
--network-plugin kubenet \
--no-ssh-key \
--dns-service-ip $DNS_SRV \
--service-cidr $SRV_CIDR \
--pod-cidr $POD_CIDR \
--docker-bridge-address $DOCKER_BRIDGE_ADDRESS \
```

```
--debug
```

Get Credentials

```
az aks get-credentials --resource-group $RG_NAME --name $CLUSTER_NAME
```

Connect ACR with AKS cluster

```
#bGet AKS Client Id and AKS Id

CLIENT_ID=$(az aks show -g $RG_NAME -n $CLUSTER_NAME --query "servicePrincipalProfile.clientId" --output tsv)

ACR_ID=$(az acr show --name $ACR_Name --resource-group $RG_NAME --query "id" --output tsv)
```

Give AKS access to ACR

```
az role assignment create --assignee $CLIENT_ID --role acrpull --scope $ACR_ID
```

Go to your [Azure DevOps](#) create an account and create a new project.

The screenshot shows the Microsoft Azure website with the URL azure.microsoft.com/en-us/services/devops/. The page title is "Azure DevOps Services". The main content area features a large illustration of people working on a rocket launch, symbolizing software development and deployment. Below the illustration, there are three main service cards: "Azure Boards" (agile tools), "Azure Pipelines" (CI/CD), and "Azure Repos" (Git repos). Each card has a brief description and a "Learn more" link. At the bottom of the page, there is a navigation bar with links like "Azure DevOps", "Azure DevOps Services", "Customer stories", "Documentation >", "Support >", "Pricing >", and "Blog >".

The screenshot shows the Azure DevOps Project Summary page for the 'AzureTECHathon' project. The left sidebar includes links for Overview, Summary, Dashboards, Wiki, Boards, Repos, Pipelines (which is selected), Test Plans, Artifacts, and Compliance. The main content area features a welcome illustration of a person working at a desk with a dog. Below it, a section titled 'Welcome to the project!' asks 'What service would you like to start with?' and lists 'Boards', 'Repos', 'Pipelines', 'Test Plans', and 'Artifacts'. A note says 'or manage your services'. To the right, there's a 'Project stats' section with a message 'No stats are available at this moment. Setup a service to see project activity.' and a 'Members' section showing one member named 'AN'.

Create a new pipeline:

The screenshot shows the 'Create a new pipeline' step in Azure DevOps. The left sidebar shows the same navigation as the previous screenshot. The main area has tabs for 'Connect', 'Select', 'Configure', and 'Review'. The 'Connect' tab is active, showing a list of code sources: 'Azure Repos Git' (YAML), 'Bitbucket Cloud' (YAML), 'GitHub' (YAML), 'GitHub Enterprise Server' (YAML), 'Other Git', and 'Subversion'. A red oval highlights the text 'Use the classic editor to create a pipeline without YAML.' located below the GitHub entry.

Git repo used ([here](#))

https://dev.azure.com/andranecula/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?a=build-definition-getting-started&id=0

Azure DevOps andranecula / AzureTECHathon / Pipelines

Select a source

Azure Repos Git GitHub GitHub Enterprise Server Subversion Bitbucket Cloud Other Git

We need your authorization to access your repositories

Connection name * azureTechathon

Authorize using OAuth Or Authorize with a GitHub personal access token

Continue

Project settings https://dev.azure.com/andranecula

https://dev.azure.com/andranecula/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?a=build-definition-getting-started&id=0

Azure DevOps andranecula / AzureTECHathon / Pipelines

Select a source

Azure Repos Git GitHub GitHub Enterprise Server Subversion Bitbucket Cloud Other Git

Authorized using connection: azureTechathon Change

Repository * | Manage on GitHub andranecula/azuretechathon ...

Default branch for manual and scheduled builds * main ...

Continue

Project settings Waiting for login.microsoftonline...

Screenshot of the Azure DevOps Pipelines "Select a template" page.

The URL is https://dev.azure.com/andraneclu/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?_a=build-definition-getting-started-template&id=0&repository=andraneclu%2F...

The left sidebar shows the project navigation: Overview, Boards, Repos, Pipelines (selected), Pipelines, Environments, Releases, Library, Task groups, Deployment groups, Test Plans, Artifacts, and Compliance.

The main area has a large circular arrow icon and the heading "Choose a template". Below it, a note says: "Choose a template that builds your kind of app. Don't worry if it's not an exact match: you can add and customize the tasks later." A red circle highlights the link "Or start with an Empty job".

Below this, there are sections for "Configuration as code" (YAML) and "Featured" templates:

- .NET Desktop**: Build and test a .NET or Windows classic desktop solution.
- Android**: Build, test, sign, and align an Android APK.
- ASP.NET**: Build and test an ASP.NET web application.
- Azure Web App for ASP.NET**: Build, package, test, and deploy an ASP.NET Azure Web App.
- Docker container**: Build a Docker image and push it to a container registry.
- Maven**: Build and test a Java project with Apache Maven.
- Python package**: Create and test a Python package on multiple Python versions.
- Xcode**: Build, test, archive, or package an Xcode workspace on macOS.

Below these is an "Others" section with the **Ant** template.

Screenshot of the Azure DevOps Pipelines "Create build definition" page for "AzureTECHathon-Cl".

The URL is https://dev.azure.com/andraneclu/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?_a=create-build-definition&id=0&repository=andraneclu%2F...

The left sidebar shows the project navigation: Overview, Boards, Repos, Pipelines (selected), Pipelines, Environments, Releases, Library, Task groups, Deployment groups, Test Plans, Artifacts, and Compliance.

The pipeline configuration shows a "Pipeline" step with a "Get sources" task and an "Agent job 1" step with a "run on agent" task. A red circle highlights the "Agent job 1" step.

The pipeline details include:

- Pipeline**: Name: AzureTECHathon-Cl
- Agent pool**: Azure Pipelines
- Agent Specification**: ubuntu-20.04

The "Parameters" section notes: "This pipeline doesn't have any pipeline parameters. Create them to share the most important settings between tasks and change them in one place." A red circle highlights the "Parameters" link.

Screenshot of the Azure DevOps Pipelines interface showing the 'Add tasks' search results for 'dock'.

The search results include:

- Docker CLI installer
- Docker Compose (highlighted with a red oval)
- Docker
- Service Fabric Compose deploy
- Azure Functions for container
- Azure App Service deploy

Marketplace section:

- Docker build task
- OWASP ZAP Scanner
- AnyCode

Screenshot of the Azure DevOps Pipelines interface showing the 'Add tasks' search results for 'copy'.

The search results include:

- Copy files over SSH
- Windows machine file copy
- Copy files (highlighted with a red oval)
- Azure file copy

Marketplace section:

- Copy
- Robocopy
- RemoteCopy
- WinRm File Copy
- Git Copy Diff
- Copy Build Steps

The screenshot shows the Azure DevOps Pipelines interface for a project named 'AzureTECHathon'. On the left, the 'Pipelines' section is selected. In the main pane, there is a pipeline named 'AzureTECHathon-CI' with one job named 'Agent job 1'. A task named 'Publish build artifacts' is being added to the pipeline. A red box highlights this task in the 'Add tasks' dialog.

The screenshot shows the configuration of the 'Build services' task in the 'Agent job 1' of the 'AzureTECHathon-CI' pipeline. The task is set to use 'Docker Compose'. The 'Container Registry Type' is set to 'Azure Container Registry' with 'acrHelloWorldStudent2' selected. The 'Docker Compose File' is set to 'Docker/docker-compose.yaml'. The 'Action' is set to 'Build service images'. A red box highlights the 'Azure subscription' dropdown, which is set to 'Scoped to subscription 'AndraNeaculak8s''.

Insert to Additional Image Tags box `$(Build.BuildId)` this will make us able to determine which image version to deploy later - build service step

Azure DevOps

andranecula / AzureTECHathon / Pipelines

... > AzureTECHathon-Cl

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

Pipeline Build pipeline

Get sources andranecula/azuretechathon main

Agent job 1 Run on agent

Build services Docker Compose

Push services Docker Compose

Run a Docker Compose command Some settings need attention

Copy Files to: Some settings need attention

Publish Artifact: drop Publish build artifacts

Display name * Push services

Container Registry Type * Azure Container Registry

Azure subscription | Manage

Azure Container Registry

Docker Compose File * Docker/docker-compose.yaml

Additional Docker Compose Files

Environment Variables

Project Name \$(Build.Repository.Name)

Qualify Image Names

Action * Push service images

Additional Image Tags

The following step is optional: Lock services will lock an image version or a repository so that it can't be deleted or updated.

Azure DevOps

andranecula / AzureTECHathon / Pipelines

... > AzureTECHathon-Cl

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

Pipeline Build pipeline

Get sources andranecula/azuretechathon main

Agent job 1 Run on agent

Build services Docker Compose

Push services Docker Compose

Lock services Docker Compose

Copy Files to: Some settings need attention

Publish Artifact: drop Publish build artifacts

Display name * Lock services

Container Registry Type * Azure Container Registry

Azure subscription | Manage

Azure Container Registry

Docker Compose File * Docker/docker-compose.yaml

Additional Docker Compose Files

Environment Variables

Project Name \$(Build.Repository.Name)

Qualify Image Names

Action * Lock service images

Remove Build Options

Azure DevOps andraneclu / AzureTECHathon / Pipelines

Search Project settings

AzureTECHathon

Overview Boards Repos Pipelines Pipelines Environments Releases Library Task groups Deployment groups Test Plans Artifacts Compliance

... > AzureTECHathon-CI

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

Pipeline Build pipeline

Get sources andraneclu/azuretechathon main

Agent job 1 Run on agent

+ Build services Docker Compose

Push services Docker Compose

Lock services Docker Compose

Copy Files to: \$(Build.ArtifactStagingDirectory)

Copy files Publish Artifact: drop Publish build artifacts

Display name * Copy Files to: \$(Build.ArtifactStagingDirectory)

Task version 2.*

Source Folder Docker

Contents deployment.yaml

Target Folder \$(Build.ArtifactStagingDirectory)

Advanced Control Options Output Variables

Project settings

This screenshot shows the Azure DevOps Pipelines interface for a project named 'AzureTECHathon'. A CI pipeline named 'AzureTECHathon-CI' is displayed. The pipeline consists of a 'Get sources' task followed by an 'Agent job 1' containing three parallel tasks: 'Build services', 'Push services', and 'Lock services'. After the agent job, there are two copy tasks: 'Copy Files to: \$(Build.ArtifactStagingDirectory)' and 'Publish Artifact: drop'. The 'Copy Files to' task is currently selected, showing its configuration details: it copies files from the Docker source folder to the \$(Build.ArtifactStagingDirectory) target folder, with contents including 'deployment.yaml'. Advanced options like Control Options and Output Variables are also visible.

https://dev.azure.com/andraneclu/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?_a=create-build-definition&id=0&repository=andraneclu%2F... Search

Project settings

Azure DevOps andraneclu / AzureTECHathon / Pipelines

Overview Boards Repos Pipelines Pipelines Environments Releases Library Task groups Deployment groups Test Plans Artifacts Compliance

... > AzureTECHathon-CI

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

Pipeline Build pipeline

Get sources andraneclu/azuretechathon main

Agent job 1 Run on agent

+ Build services Docker Compose

Push services Docker Compose

Lock services Docker Compose

Copy Files to: \$(Build.ArtifactStagingDirectory)

Copy files Publish Artifact: drop Publish build artifacts

Display name * Publish Artifact: drop

Task version 1.*

Path to publish * \$(Build.ArtifactStagingDirectory)

Artifact name * drop

Artifact publish location * Azure Pipelines

Advanced Control Options Output Variables

Project settings

This screenshot shows the same Azure DevOps Pipelines interface as the previous one, but with a different task selected. The 'Publish Artifact: drop' task is now highlighted. Its configuration includes publishing build artifacts to the \$(Build.ArtifactStagingDirectory) path, using the artifact name 'drop', and specifying the Azure Pipelines location for artifact publication. The other tasks in the pipeline remain visible but are not selected.

https://dev.azure.com/andranecula/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?a=create-build-definition&id=0&repository=andranecula%2F...

Azure DevOps andranecula / AzureTECHathon / Pipelines

AzureTECHathon + ... > AzureTECHathon-Cl

Triggers (highlighted)

Continuous integration
andranecula/azuretechathon Enabled

Pull request validation
andranecula/azuretechathon Disabled

Scheduled
No builds scheduled

+ Add

Build completion
Build when another build completes

+ Add

Branch filters
Type: Include Branch specification: main

Path filters
+ Add

Project settings

This screenshot shows the 'Triggers' tab for the 'AzureTECHathon-Cl' pipeline. It lists three triggers: 'Continuous integration' (enabled), 'Pull request validation' (disabled), and 'Scheduled' (no builds scheduled). The 'Continuous integration' trigger has its 'Enable continuous integration' checkbox checked. Below the triggers are 'Branch filters' and 'Path filters' sections.

https://dev.azure.com/andranecula/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?a=create-build-definition&id=0&repository=andranecula%2F...

Azure DevOps andranecula / AzureTECHathon / Pipelines

AzureTECHathon + ... > AzureTECHathon-Cl

Save & queue (highlighted)

Pipeline Build pipeline

Get sources
andranecula/azuretechathon main

Agent job 1 Run on agent

Build services Docker Compose

Push services Docker Compose

Lock services Docker Compose

Copy Files to: \${Build.ArtifactStagingDirectory} Copy files

Publish Artifact: drop Publish build artifacts

Save Save as draft

Name: AzureTECHathon-Cl

Agent pool: Azure Pipelines

Agent Specification: ubuntu-20.04

Parameters: This pipeline doesn't have any pipeline parameters. Create them to share the most important settings between tasks and change them in one place.

Learn more

Project settings

This screenshot shows the pipeline editor for the 'AzureTECHathon-Cl' pipeline. It displays a list of tasks: 'Get sources', 'Agent job 1' (Run on agent), 'Build services' (Docker Compose), 'Push services' (Docker Compose), 'Lock services' (Docker Compose), 'Copy Files to: \${Build.ArtifactStagingDirectory}' (Copy files), and 'Publish Artifact: drop' (Publish build artifacts). On the right, there are fields for 'Name' (set to 'AzureTECHathon-Cl'), 'Agent pool' (set to 'Azure Pipelines'), and 'Agent Specification' (set to 'ubuntu-20.04'). A note indicates that this pipeline doesn't have any pipeline parameters.

https://dev.azure.com/andranecula/AzureTECHathon/_apps/hub/ms.vss-ciworkflow.build-ci-hub?a=create-build-definition&id=0&repository=andranecula%2F...      

Azure DevOps  andranecula / AzureTECHathon / Pipelines

AzureTECHathon

Overview Boards Repos Pipelines Pipelines Environments Releases Library Task groups Deployment groups Test Plans Artifacts Compliance

... > AzureTECHathon-Cl

Pipeline Build pipeline

Get sources andranecula/azuretechathon main

Agent job 1 Run on agent

+ Agent services Docker Compose

+ Push services Docker Compose

+ Lock services Docker Compose

Copy Files to: \$(Build.ArtifactStagingDirectory) Copy files

Publish Artifact: drop Publish build artifacts

Run pipeline

Select parameters below and manually run the pipeline

Save comment v|

Name * AzureTECHathon-Cl

Agent pool * Azure Pipelines

Agent Specification * ubuntu-20.04

Branch/tag main

Commit

Parameters This pipeline doesn't have any pipeline tasks and change them in one place.

Advanced options

Variables 1 Variable defined

Demands This pipeline has no defined demands

Enable system diagnostics Save and run Cancel

https://dev.azure.com/andranecula/AzureTECHathon/_build/results?buildId=31&view=results         

Azure DevOps andranecula / AzureTECHathon / Pipelines / AzureTECHathon-Cl / 31

Project settings  

#31 on AzureTECHathon-Cl

Summary

Manually run by Andra Necula

Repository and version andranecula/azuretechathon main

Time started and elapsed Just now

Related 0 work items

Tests and coverage Get started

View change

Jobs

Name	Status	Duration
Agent job 1	Queued	

The screenshot shows the Azure DevOps Pipelines interface. On the left, the navigation bar includes 'Overview', 'Boards', 'Repos', 'Pipelines' (selected), 'Environments', 'Releases', 'Library', 'Task groups', 'Deployment groups', 'Test Plans', 'Artifacts', and 'Compliance'. The main area displays 'Jobs in run #32' for 'AzureTECHathon-Cl'. A specific job, 'Agent job 1', is expanded, showing its steps and duration: Initialize job (3s), Checkout andrane... (2s), Build services (16s), Push services (19s), Lock services (3s), Copy Files to: /home/... (<1s), Publish Artifact: drop (<1s), Component Detection... (17s), Post-job: Checkout an... (<1s), and Finalize Job (<1s). The log for this job is displayed on the right, showing the command-line output of the pipeline execution.

Now in Azure portal we have created:

The screenshot shows the Azure portal interface. On the left, the navigation bar includes 'Name ↑', 'DefaultResourceGroup-EUS', 'MC_rg-aks-HelloStudent2_aks2_eastus', 'NetworkWatcherRG', and 'rg-aks-HelloStudent2'. The main area displays a table of resources under 'Subscription ↑' and 'Location ↑'. The table includes four entries: 'East US' (three entries) and 'East US' (one entry). On the right, there is a detailed view of the 'rg-aks-HelloStudent2' resource group, showing 'Settings' like 'Quickstart', 'Deployments', 'Policies', 'Properties', 'Locks', and 'Cost Management'. Below this, a table lists two resources: 'acrHelloWorldStudent2' (Container registry, East US) and 'aks2' (Kubernetes service, East US).

Next step is to deploy our application:

The screenshot shows the Azure DevOps Releases interface. On the left, the navigation bar includes 'Overview', 'Boards', 'Repos', 'Pipelines' (selected), 'Environments', 'Releases' (selected), 'Library', 'Task groups', 'Deployment groups', 'Test Plans', 'Artifacts', and 'Compliance'. The main area features a rocket launch illustration and the text 'No release pipelines found'. It includes a call-to-action 'Automate your release process in a few easy steps with a new pipeline' and a 'New pipeline' button.

https://dev.azure.com/andraneclu/AzureTECHathon/_releaseDefinition?definitionId=0&_a=action-create-definition&source=ReleaseNew&path=%5C

Azure DevOps andraneclu / AzureTECHathon / Pipelines / Releases

All pipelines > New release pipeline

Pipeline Tasks Variables Retention Options History

Artifacts | + Add Stages | + Add

+ Add an artifact Stage 1 Select a template

Schedule not set

Select a template
Or start with an Empty job

Search

Featured

- Azure App Service deployment
- Deploy your application to Azure App Service. Choose from Web App on Windows, Linux, containers, Function Apps, or WebJobs.
- Deploy a Java app to Azure App Service
- Deploy a Java application to an Azure Web App.
- Deploy a Node.js app to Azure App Service
- Deploy a Node.js application to an Azure Web App.
- Deploy a PHP app to Azure App Service and Azure Database for MySQL
- Deploy a PHP application to an Azure Web App and database to Azure Database for MySQL.
- Deploy a Python app to Azure App Service and Azure database for MySQL
- Deploy a Python Django, Bottle, or Flask application to an Azure Web App and database to Azure Database for MySQL.
- Deploy to a Kubernetes cluster
- Deploy, configure, update your containerized applications to a Kubernetes cluster.
- IIS website and SQL database deployment
- Deployment Group: Deploy ASP.NET or ASP.NET Core web applications to an IIS Website and SQL database on physical or virtual machines (VM).

Others

- Azure App Service deployment with continuous monitoring
- Deploy your Web applications to Azure App Service and enable continuous monitoring using Application Insights.
- Azure App Service deployment with slot
- Deploy your Azure Web App to a staging slot and swap slots to deploy to production.
- Azure App Service deployment with tests

Project settings

Azure DevOps andraneclu / AzureTECHathon / Pipelines / Releases

All pipelines > New release pipeline

Pipeline Tasks Variables Retention Options History

Artifacts | + Add Stages | + Add

+ Add an artifact Stage 1 1 job, 0 task

Schedule not set

Save Create release View releases

Stage

Stage 1

Properties ^
Name and owners of the stage

Stage name: Stage 1

Stage owner: Andra Necula

All pipelines > **New release pipeline**

Pipeline Tasks Variables Retention Options History

Artifacts | + Add **Stages** | + Add

Add an artifact

Source type: Build

Project: AzureTECHathon

Source (build pipeline): AzureTECHathon-Cl

Default version: Latest

Source alias: AzureTECHathon-Cl

The artifacts published by each version will be available for deployment in release pipelines. The latest successful build of AzureTECHathon-Cl published the following artifacts: drop.

Add

All pipelines > **New release pipeline**

Pipeline Tasks Variables Retention Options History

Stage 1 Deployment process

Agent job Run on agent

Stage name: Stage 1

Add

All pipelines > **New release pipeline**

Pipeline Tasks Variables Retention Options History

Stage 1 Deployment process

Agent job Run on agent

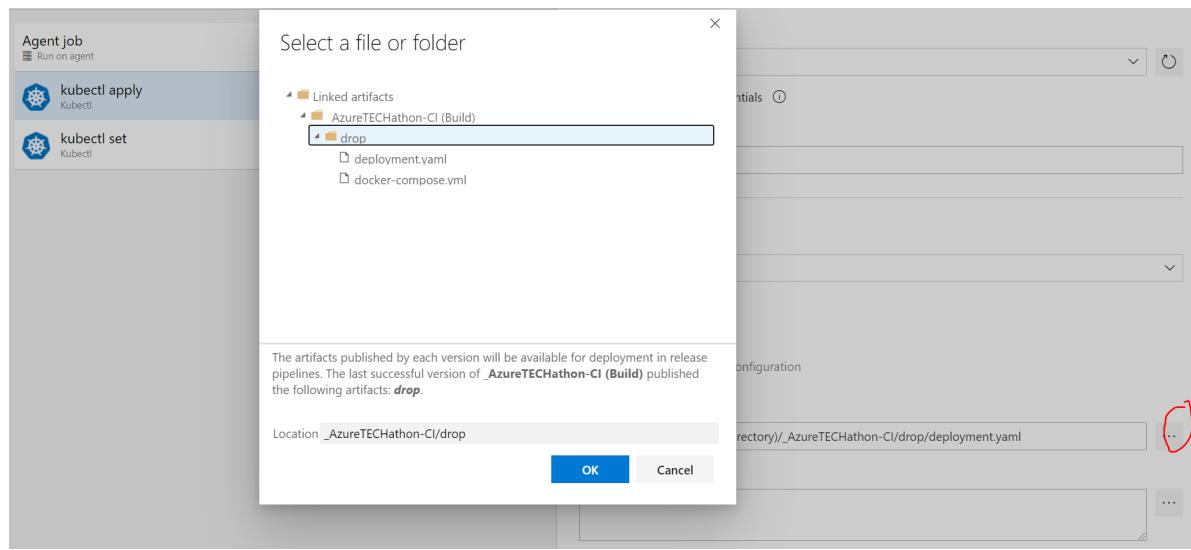
Add tasks | Refresh

kubectl

- Kubectl tool installer
- Kubectl** Deploy, configure, update a Kubernetes cluster in Azure Container Service by running kubectl commands
- kubectl exec
- Kubernetes General Task
- Kubernetes Apply Task
- k8s downloader

Marketplace ^

- Kubernetes extension



A screenshot of the Azure DevOps Pipeline configuration screen. The left sidebar shows the "Pipelines" section is active. The main area shows a "New release pipeline" being created. It has one stage named "Stage 1: Deployment process". Inside the stage, there's an "Agent job" task set to "Run on agent" and a "kubectl apply" task. The "kubectl apply" task is currently selected. The configuration for this task includes:

- File path:** \${System.DefaultWorkingDirectory}/_AzureTECHathon-CI/drop/deployment.yaml
- Arguments:** An empty text input field.
- Secrets:** A dropdown menu.
- ConfigMaps:** A dropdown menu.
- Advanced:** A collapsed section.
- Kubectl:** A section with a radio button for "Version" (selected) and "Specify location".
- Version spec:** The value "1.17.1" is entered.
- Check for latest version:** An unchecked checkbox.
- Working directory:** \${System.DefaultWorkingDirectory}
- Output format:** json
- Control Options:** A collapsed section.
- Output Variables:** A collapsed section.

The screenshot shows the Azure DevOps interface for creating a new release pipeline. On the left, the sidebar is open with the 'Pipelines' section selected. The main area displays a 'New release pipeline > Release-1 > Stage 1' with a status of 'Succeeded'. The 'Tasks' tab is active. A single task, 'kubectl apply', is listed under 'Agent job' with the 'Run on agent' option selected. The task configuration shows the Kubernetes cluster 'aks2' and the command 'kubectl set image deployments/hellostudent-deployment hellostudent=acrhelloworldstudent2.azurecr.io/hellostudent:\$Build.BuildId'. Below the command, the 'Arguments' field contains 'image deployments/hellostudent-deployment hellostudent=acrhelloworldstudent2.azurecr.io/hellostudent:\$Build.BuildId'. Other sections like 'Secrets', 'ConfigMaps', 'Advanced', 'Control Options', and 'Output Variables' are visible but empty.

Click `Save` and `Create release`

In your terminal:

```
root@MININT-030VQ3T:/mnt/c/Users/andranecula/AKS Engineer/Project# kubectl get all
NAME                                         READY   STATUS    RESTARTS   AGE
pod/hellostudent-deployment-bc95ccbff-27x24   1/1     Running   0          66s

NAME                   TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
service/hellostudent-service   LoadBalancer   10.3.31.216   52.170.171.219   80:32605/TCP   68s
service/kubernetes         ClusterIP     10.3.0.1       <none>           443/TCP      85m

NAME                           READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/hellostudent-deployment   1/1     1           1           70s

NAME                               DESIRED   CURRENT   READY   AGE
replicaset.apps/hellostudent-deployment-5c5f974595   0         0         0         70s
replicaset.apps/hellostudent-deployment-bc95ccbff   1         1         1         67s
root@MININT-030VQ3T:/mnt/c/Users/andranecula/AKS Engineer/Project# curl 52.170.171.219
Hello Student!root@MININT-030VQ3T:/mnt/c/Users/andranecula/AKS Engineer/Project#
```



Hello Student!

