

Azure DevOps Overview

Azure DevOps is a powerful set of development tools and services by **Microsoft** that helps teams plan, build, test, and deliver software faster and more efficiently.

It offers a complete DevOps toolchain for developing and deploying software, and it integrates seamlessly with popular tools like **GitHub**, **Docker**, **Kubernetes**, and more.

🌟 Key Features

- 📋 **Azure Boards** – Agile project management with Kanban boards, backlogs, and dashboards.
- 💻 **Azure Repos** – Unlimited, cloud-hosted private Git repositories.
- ⚙️ **Azure Pipelines** – CI/CD for any language, platform, and cloud.
- 📦 **Azure Artifacts** – Package management for Maven, npm, NuGet, and Python.
- 🛠️ **Azure Test Plans** – Manual and exploratory testing tools.

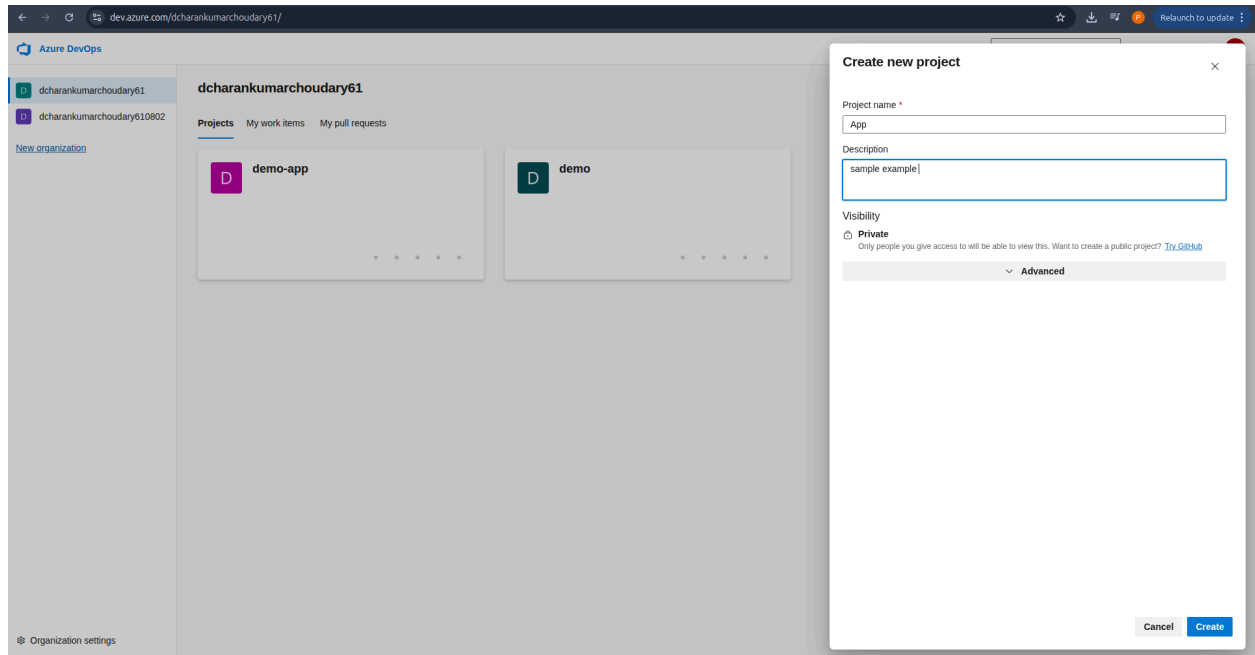
🔗 Benefits

- 🌐 Cross-platform support (Windows, Linux, macOS).
- 🔄 Seamless integration with GitHub, Bitbucket, and other repos.
- ☁️ Deploy to **Azure**, **AWS**, **GCP**, or on-premises servers.
- 🚀 Faster delivery with automated builds and releases.

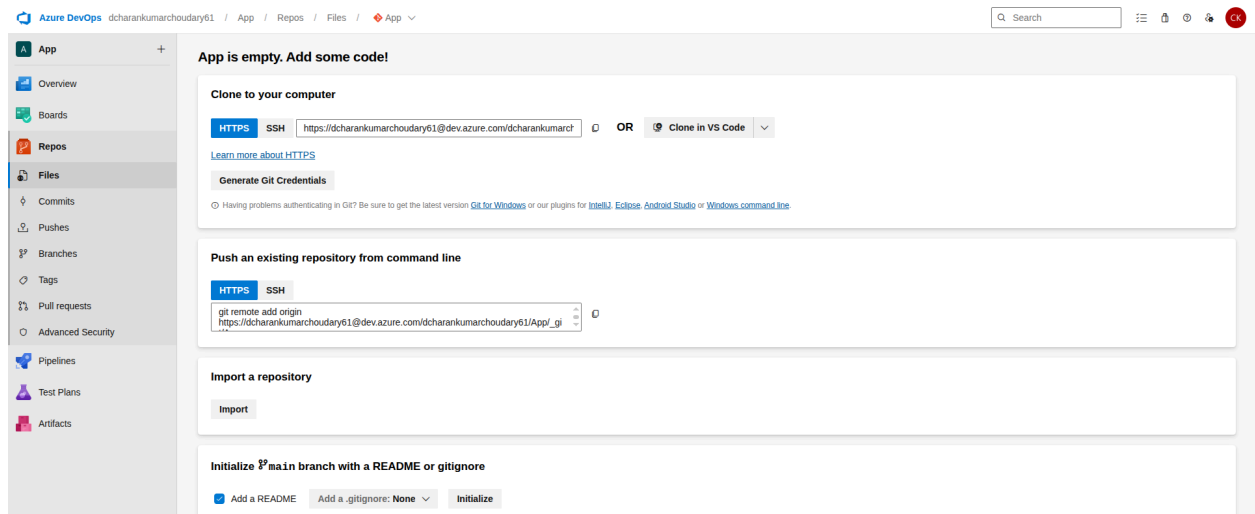
Creation Of Azure Pipelines

Step 1: Login into the azure Devops

Step 2: Create a Project



Step 4: Click on Repos And click on import My Repo is in Github.



- Provide the Github Repo url and click on import

Import a Git repository

×

Repository type

Git

▼

Clone URL *

e.g. https://github.com/Microsoft/vscode.git

☐ Requires Authentication

Cancel

Import

Step 5: Need to check the Default branch as the default branch is main.

- Go branches and click on 3 dots and make the default branch

Azure DevOps

dcharanikumarchoudary61 / App / Repos / Branches / App

App

Overview

Boards

Repos

Files

Commits

Pushes

Branches

Tags

Pull requests

Advanced Security

Pipelines

Test Plans

Artifacts

Branches

Mine All State

Search branch name

Branch	Commit	Author	Authored Date	Behind Ahead	Status	Pull Re...
dependabot						
npm_and_yaml/result						
express-4.19.2	4d9ff45e	dependabot[bot]	Mar 28, 2024			★
nuget/worker						
Npgsql-8.0.3	7c1526c0	dependabot[bot]	May 9, 2024	1 1		
duplicate_key	67a2e880	sophia parafina	Jan 21, 2017	145 0		
main	63a9158c	Michael Irwin	Oct 10, 2024	1 10		★
revert-54-connection_pooling	9352ed89	Mano Marks	Dec 27, 2016	154 0		
scout-fix	59a9d864	Ajeet Singh Raina	Aug 17, 2023	11 1		

New branch

New pull request

Delete branch

View files

View History

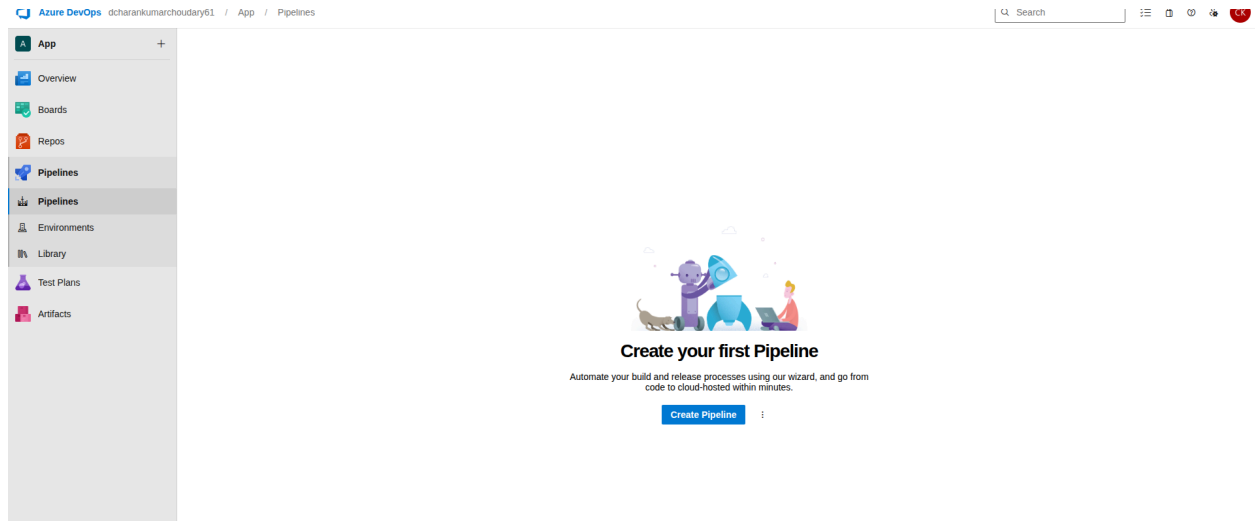
Compare branches

Set as compare branch

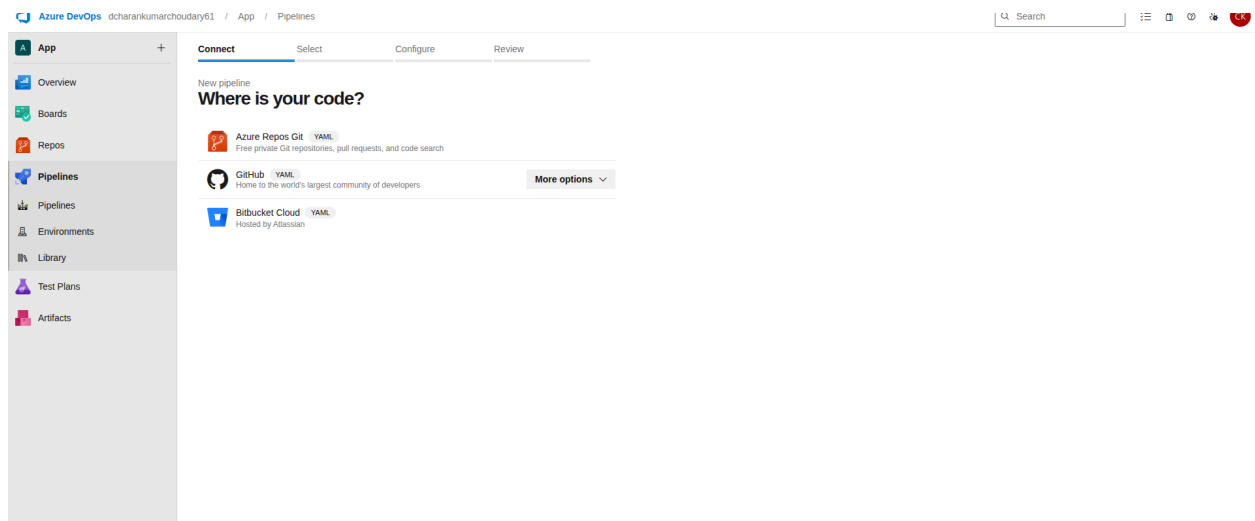
Set as default branch

Step 6: Create A pipeline I have 3- micro services one is worker,result,vote, I will create 3 separate pipeline for 3 services

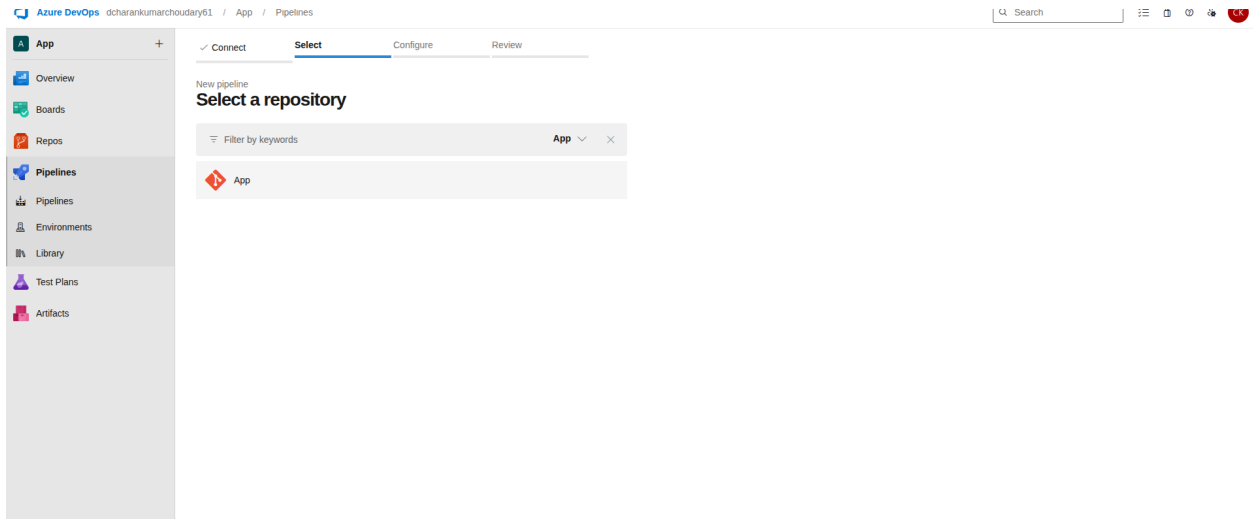
Click on pipeline. Setup of the pipeline:



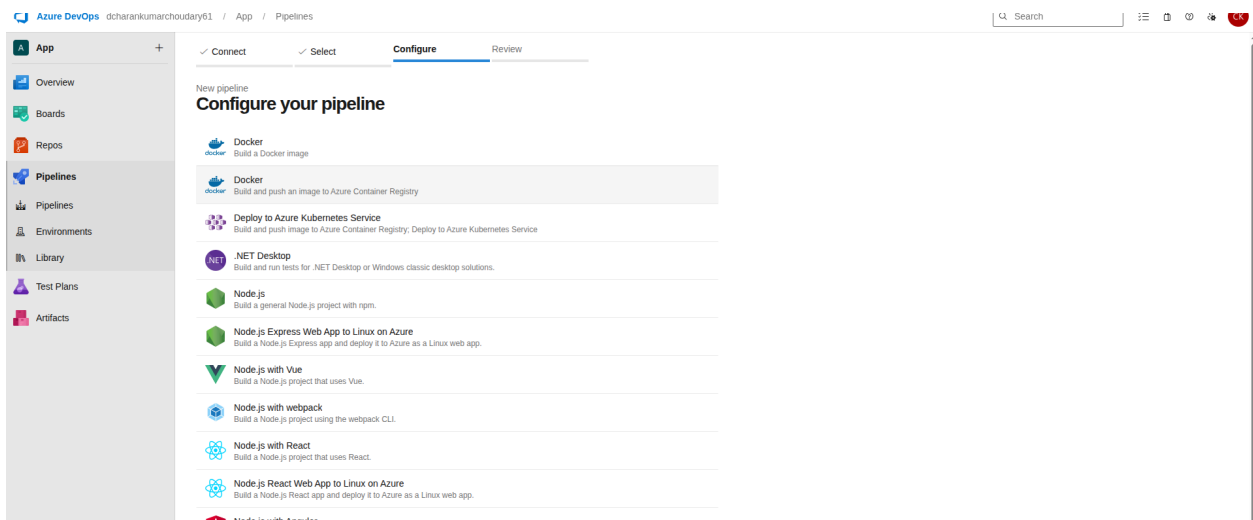
Select the Azure Repo



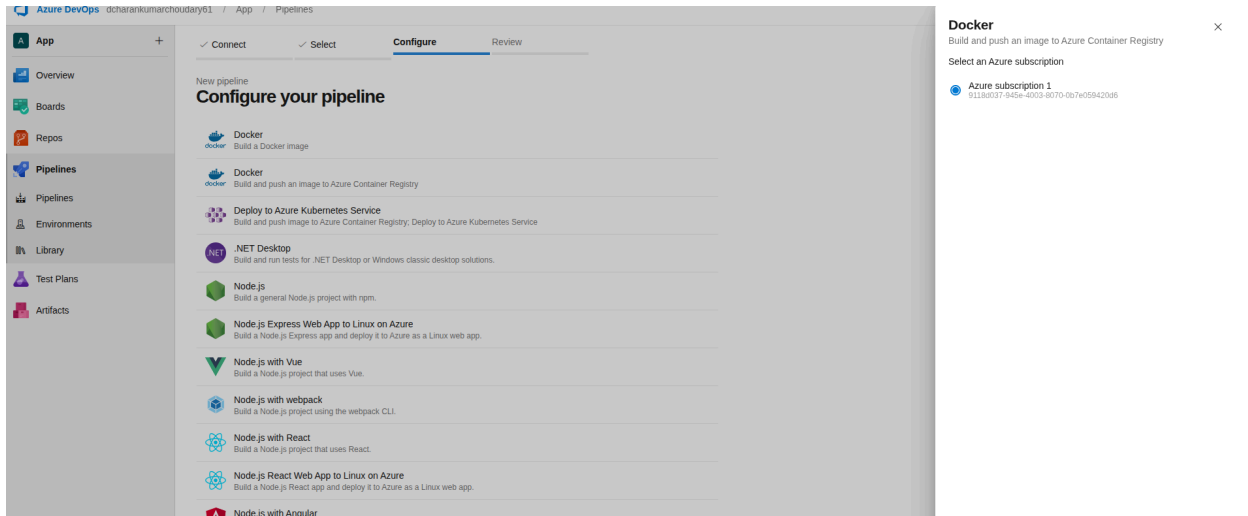
- I selected Previous created repo



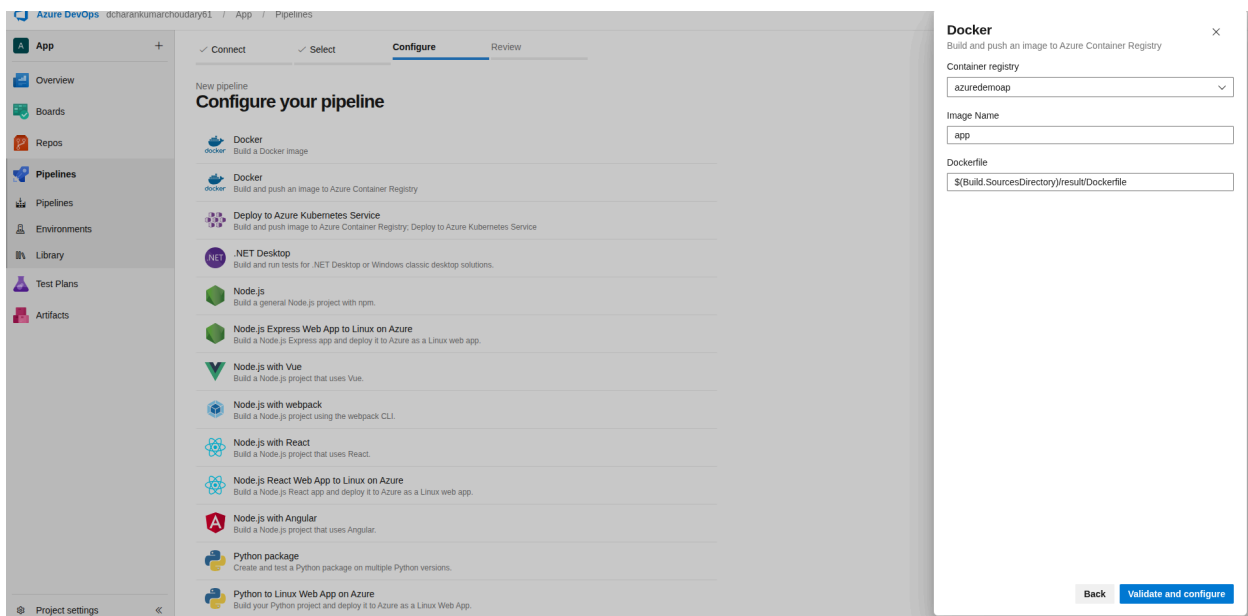
- Select the Docker build and Push image to Azure container Registry



Need to select the azure subscription i have azure container registry so this is for authentication to azure container registry and pipeline



- Select the container registry and click on validate and configure.

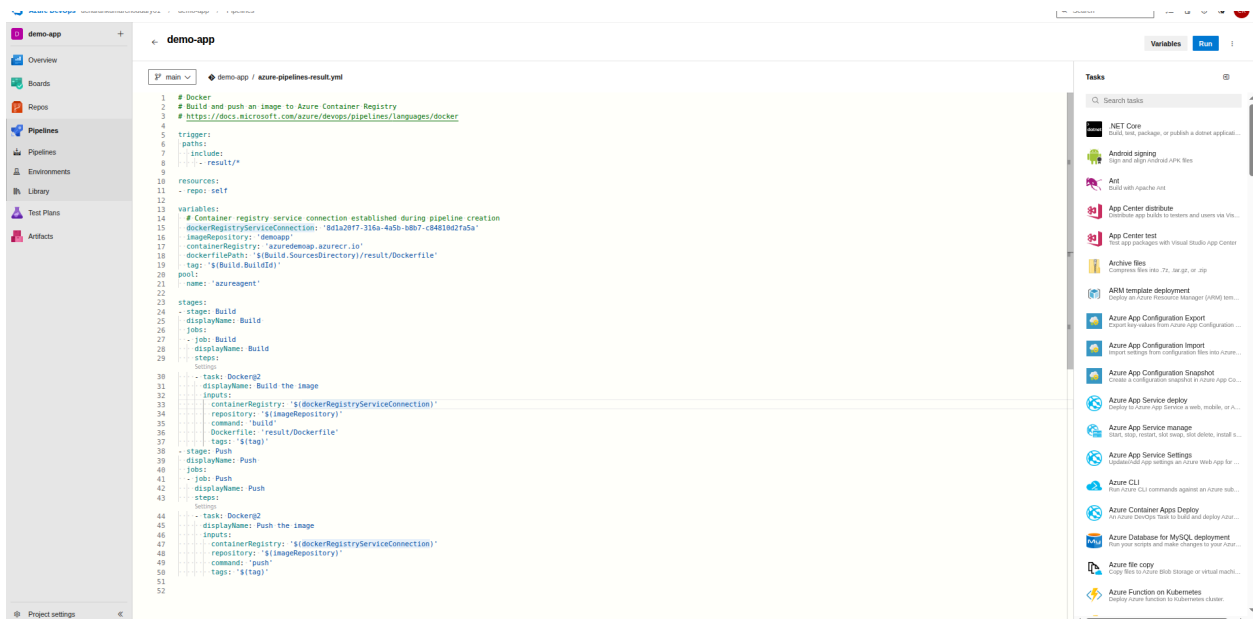


Azure Pipeline structure:

Pipeline → Stage(s) → Job(s) → Step(s) → Task(s)/Script(s)

- **Stage:** Logical grouping of jobs (e.g., *Build*, *Test*, *Deploy*).
- **Job:** Runs on an agent (e.g., Ubuntu, Windows).

- **Step:** Single unit of execution inside a job (can be a task or a script).



trigger:

paths:

include:

- result/*

resources:

- repo: self

variables:

Container registry service connection established during pipeline creation

dockerRegistryServiceConnection: '8d1a20f7-316a-4a5b-b8b7-c84810d2fa5a'

imageRepository: 'demoapp'

```
containerRegistry: 'azuredemoap.azurecr.io'
```

```
dockerfilePath: '$(Build.SourcesDirectory)/result/Dockerfile'
```

```
tag: '$(Build.BuildId)'
```

pool:

name: 'azureagent'

stages:

- stage: Build

displayName: Build

jobs:

- job: Build

displayName: Build

steps:

- task: Docker@2

displayName: Build the image

inputs:

containerRegistry: '\$(dockerRegistryServiceConnection)'

repository: '\$(imageRepository)'

command: 'build'

Dockerfile: 'result/Dockerfile'

tags: '\$(tag)'

- stage: Push

displayName: Push

jobs:


```
- job: Push

  displayName: Push

  steps:

  - task: Docker@2

    displayName: Push the image

    inputs:

      containerRegistry: '$(dockerRegistryServiceConnection)'

      repository: '$(imageRepository)'

      command: 'push'

      tags: '$(tag)'
```

Now We have Mentioned the agent Self hosted agent so that we need to create agent as vm.

Create a VM in Azure

- Use Azure Portal or CLI to create a Linux/Windows VM.
- Ensure it has internet access.

Install prerequisites on the VM

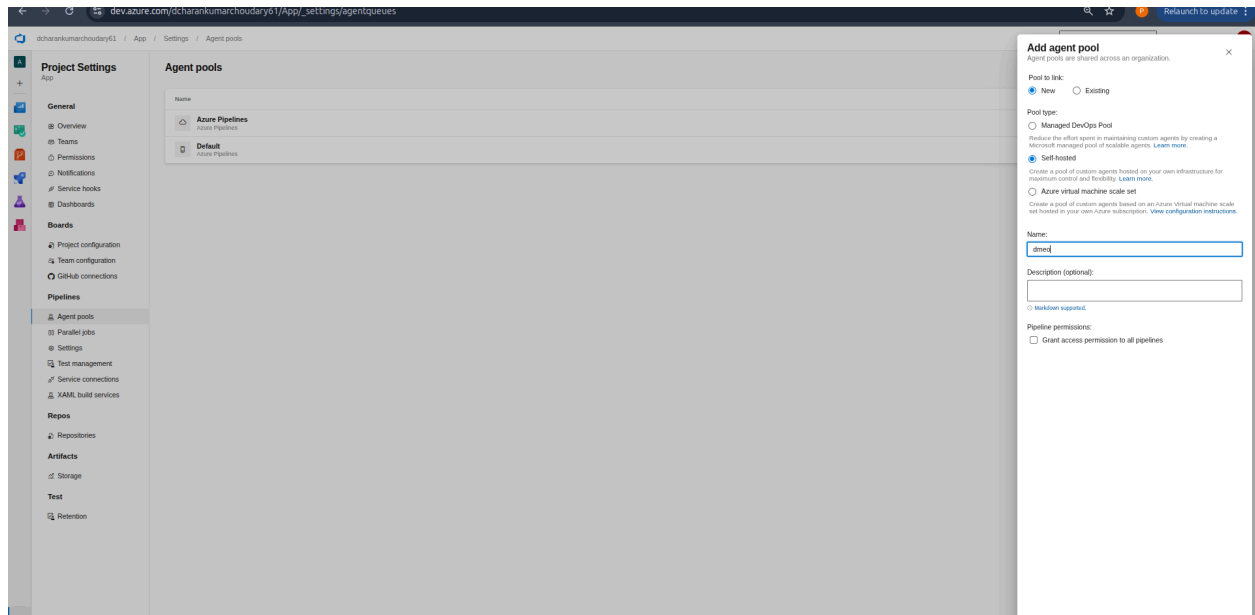
- Update packages.

Create a Personal Access Token (PAT) in Azure DevOps

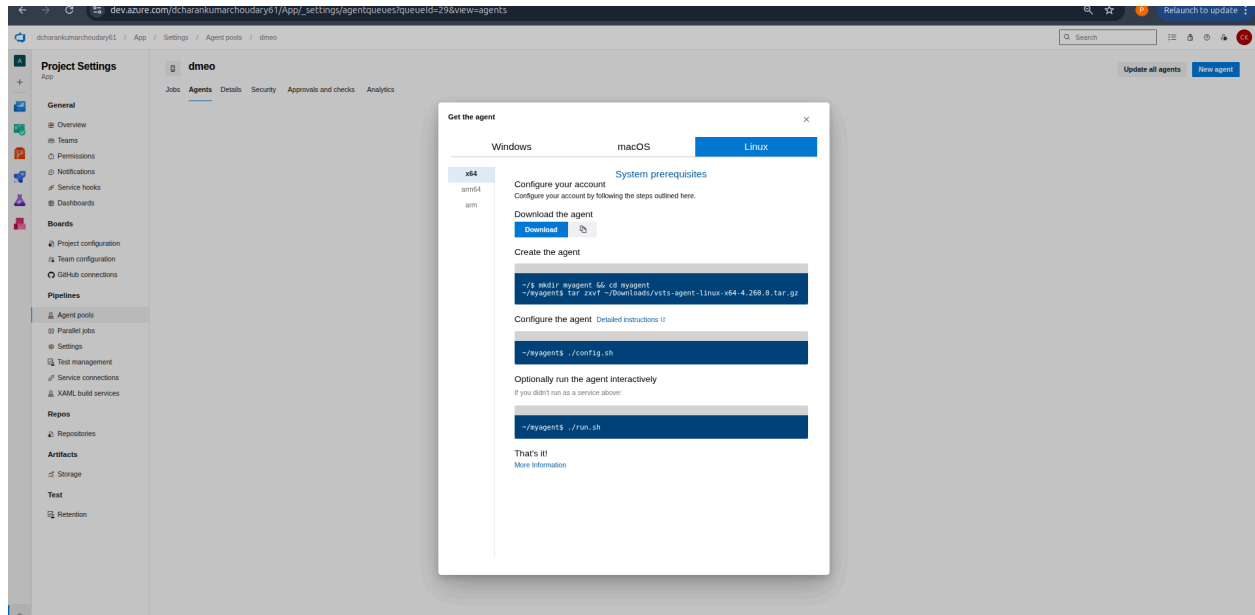
- Go to **User settings** → **Personal Access Tokens**.
- Scope: **Agent Pools** → **Read & manage**.

Download the Azure Pipelines agent

- Go to **Project Settings** → **Agent Pools** → **Default** → **New Agent**.



Configure the agent



```
./run-docker.sh
./env.sh
azureuser@azureagent:~/myagent$ ls
./run-docker.sh  ./env.sh  external: license.html  reauth.sh  run-docker.sh  run.sh  vsts-agent-linux-x64-4.260.0.tar.gz
azureuser@azureagent:~/myagent$ sudo ./config.sh
sudo: ./config.sh: command not found
azureuser@azureagent:~/myagent$ ./config.sh

  AZURE PIPELINES
  agent v4.260.0 (commit 531b769)

>> End User License Agreements:

Building sources from a TFVC repository requires accepting the Team Explorer Everywhere End User License Agreement. This step is not required for building sources from Git repositories.
A copy of the Team Explorer Everywhere license agreement can be found at:
/home/azureuser/myagent/license.html

Enter (Y/N) Accept the Team Explorer Everywhere license agreement now? (press enter for N) > Y

>> Connect:

Enter server URL > https://dev.azure.com/dcharankumarchoudary61
Enter authentication type (press enter for PAT) > 3eXJwdecPUxpLXSEW0FGbbCehl33mBZTSFYlp3FOF3U900EdFYzsJQQ399BHACAAAAAAAAAAAAAAAZD044KD
Enter authentication type (press enter for PAT) >
Enter personal access token > *****
Connecting to server ...

>> Register Agent:

Enter agent pool (press enter for default) > azureagent
Enter agent name (press enter for azureagent) > azureagent
Scanning for tool capabilities.
Connecting to the server..
Successfully added the agent
Testing agent connection.
```

```
Building sources from a TFVC repository requires accepting the Team Explorer Everywhere End User License Agreement. This step is not required for building sources from Git repositories.

A copy of the Team Explorer Everywhere license agreement can be found at:
/home/azureuser/myagent/license.html

Enter (Y/N) Accept the Team Explorer Everywhere license agreement now? (press enter for N) > Y

>> Connect:

Enter server URL > https://dev.azure.com/dcharankumarchoudary61
Enter authentication type (press enter for PAT) > 3eXJwdecPUxpLXSEWOFcbbCehL33mBZTSFYip3FOF3U900EdFYzsJQJ399BHACAAAAAAAAAAAAASAZD044KD
Enter a valid value for authentication type.
Enter authentication type (press enter for PAT) >
Enter personal access token > *****
Connecting to server ...

>> Register Agent:

Enter agent pool (press enter for default) > azureagent
Enter agent name (press enter for azureagent) > azureagent
Scanning for tool capabilities.
Connecting to the server.
Successfully added the agent
Testing agent connection.
Enter work folder (press enter for _work) >
2025-08-13 07:59:38Z: Settings Saved.
azureuser@azureagent:~/myagent$ ./config.sh

  AZURE PIPELINES
  agent v4.260.0 (commit 531b769)

Error reported in diagnostic logs. Please examine the log for more details.
/home/azureuser/myagent/_diag/Agent_20250813-080006-utc.log
Cannot configure the agent because it is already configured. To reconfigure the agent, run 'config.cmd remove' or './config.sh remove' first.
azureuser@azureagent:~/myagent$ ./run.sh
Scanning for tool capabilities.
Connecting to the server.
2025-08-13 08:00:29Z: Listening for Jobs
```

- Run `./config.sh` (Linux) or `config.cmd` (Windows).
- Enter Azure DevOps URL, choose authentication type **PAT**, paste token, select agent pool, and name the agent.

Verify in Azure DevOps

- Go to **Agent Pools** and confirm your agent is **Online**.

dev.azure.com/dcharankumarchoudary61/demo-app/_settings/agentpools?queueId=196&view=agents

dcharankumarchoudary61 / demo-app / Settings / Agent pools / azureagent

As previously announced in our blog, we are transitioning to new IP addresses. If you have not done so already, please update your firewall allowlists with new IP address ranges of Azure DevOps Services. For detailed information and the latest updates, visit our [status page](#).

Project Settings

demo-app

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

azureagent

Update all agents New agent

Jobs Agents Details Security Approvals and checks Analytics

Name	Last run	Current status	Agent version	Enabled
azureagent Online		Idle	4.260.0	On

Now Run the pipeline

dev.azure.com/dcharankumarchoudary61/demo-app/_build/results?buildId=46&view=results

Azure DevOps dcharankumarchoudary61 / demo-app / Pipelines / demo-app / 20250813.3

demo-app

- Overview
- Boards
- Repos
- Pipelines
 - Pipelines
 - Environments
 - Library
 - Test Plans
 - Artifacts
- Project settings

#20250813.3 • Set up CI with Azure Pipelines

demo-app

Run new

This run is being retained as one of 3 recent runs by main (Branch). [View retention leases](#)

Summary

Manually run by Charan Kumar

View 236 changes

Repository and version
demo-app
main 839c591c

Time started and elapsed
Today at 1:37 PM
2m 30s

Related
0 work items
0 artifacts

Tests and coverage
Get started

Stages

Jobs

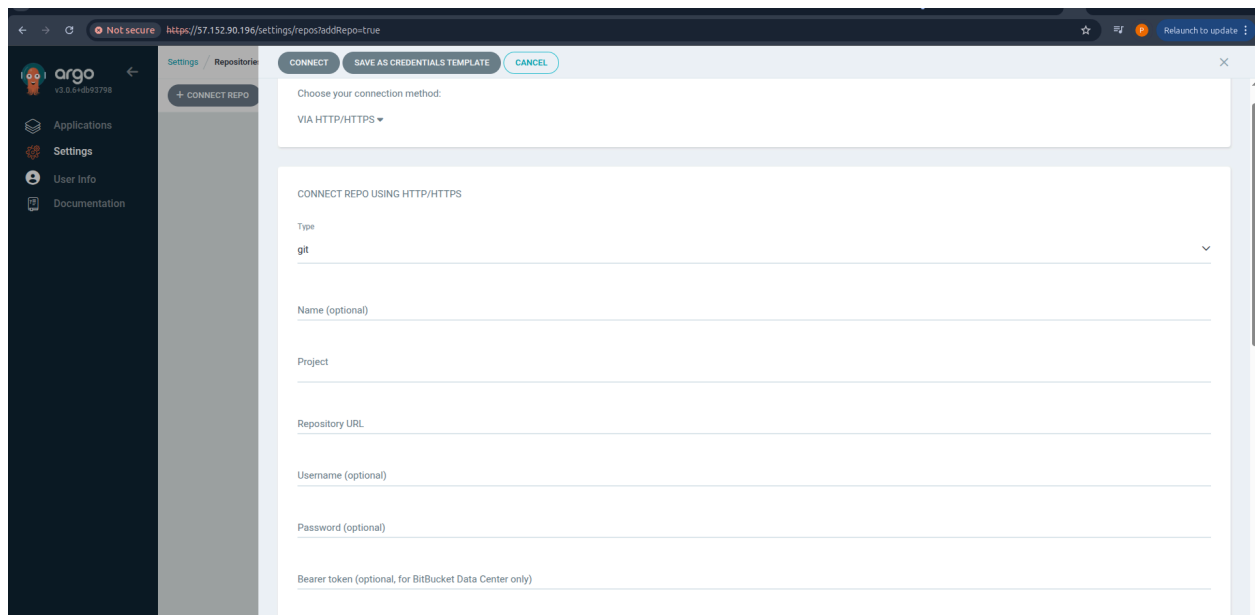
Build 1 job completed 1m 21s	Push 1 job completed 49s
--	------------------------------------

CD-Part:

STEP 1: Create a EKS CLUSTER

STEP 2: INSTALL ARGOCD AND ACCESS THE ARGOCD DASHBOARD

STEP 3: SETUP-AZURE REPO



- Need to Create a Token in azure repo

STEP 4: WRITE SHELL SCRIPT TO AUTOMATICALLY UPDATE THE BUILD NUMBER IN DEPLOYMENT.YAML-FILE

- NEED TO CREATE FOLDER “scripts/updateK8SManifests.sh

```
#!/bin/bash
```

```
set -x
```

```
# Set the repository URL
```

```
REPO_URL="https://FcIEkLDKq6OHNA15kX9U9snjie7mJNRppwcVKCc2EZWfgzG7UnfhJQQJ99BHACAAAAAASAZDOsmNP@dev.azure.com/dcharankumarchoudary61/demo-app/_git/demo-app"
```

```
# Clone the git repository into the /tmp directory
```

```
git clone "$REPO_URL" /tmp/temp_repo
```

```

# Navigate into the cloned repository directory
cd /tmp/temp_repo

# Make changes to the Kubernetes manifest file(s)
# For example, let's say you want to change the image tag in a deployment.yaml file
sed -i "s|image:.*|image: azuredemoap.azurecr.io/$2:$3|g"
k8s-specifications/$1-deployment.yaml

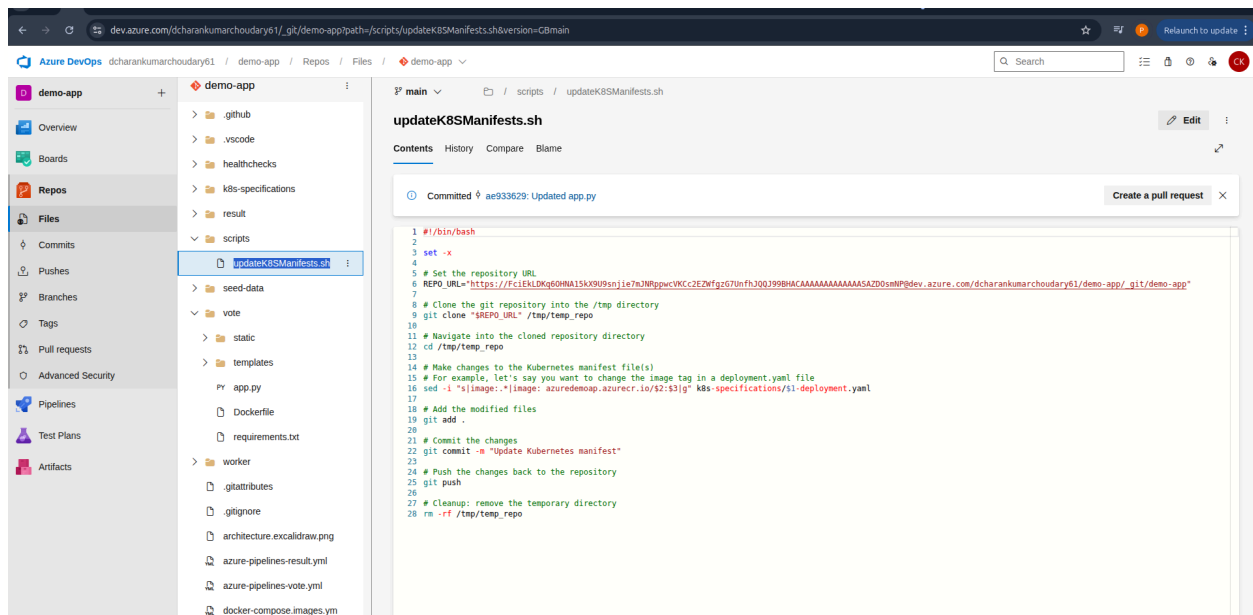
# Add the modified files
git add .

# Commit the changes
git commit -m "Update Kubernetes manifest"

# Push the changes back to the repository
git push

# Cleanup: remove the temporary directory
rm -rf /tmp/temp_repo

```



STEP 4: NEED TO ADD THE STAGE IN PIPELINE TO RUN THE SCRIPT.

```

- stage: update

  displayName: update

  jobs:

  - job: update

    displayName: update

    steps:

    - task: ShellScript@2

      inputs:

        scriptPath: 'scripts/updateK8SManifests.sh'

        args: 'vote $(imageRepository) $(tag)'

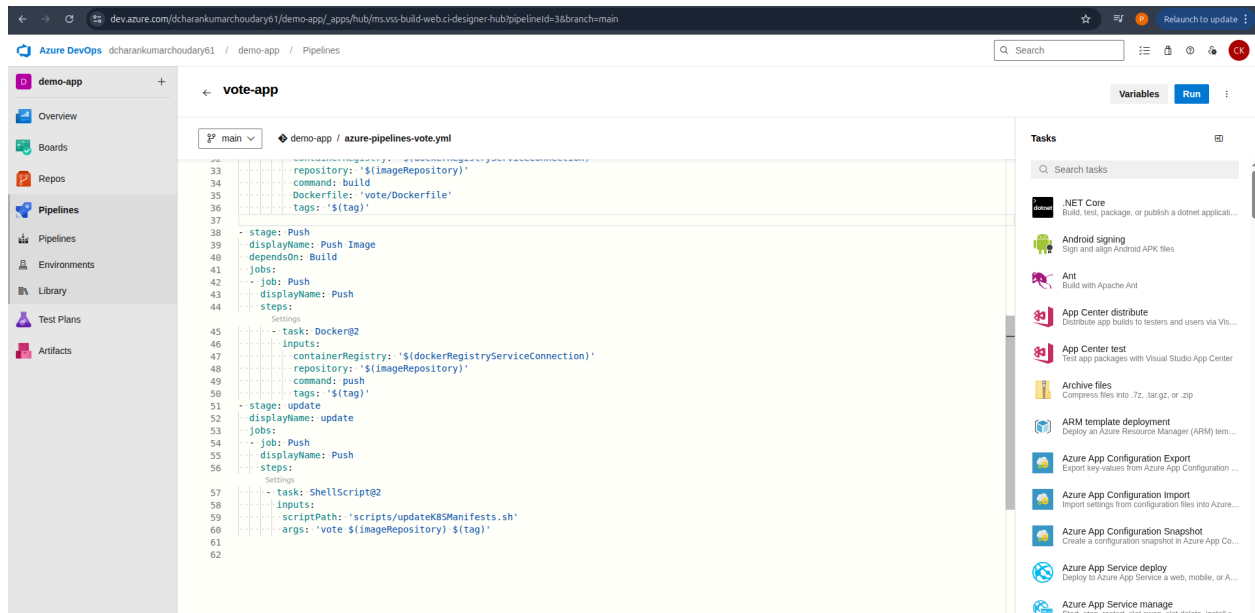
```

The screenshot shows the Azure DevOps web interface for a pipeline named 'vote-app' in the 'demo-app' project. The left sidebar contains navigation links for Overview, Boards, Repos, Pipelines, Environments, Test Plans, and Artifacts. The main area displays the YAML configuration for the pipeline, which is currently on the 'main' branch. The configuration defines three stages: 'Build', 'Push', and 'update'. The 'Build' stage contains a 'Build' job with a 'Build' task. The 'Push' stage contains a 'Push' job with a 'Push' task. The 'update' stage contains an 'update' job with a 'ShellScript@2' task. The 'ShellScript@2' task is configured with the script path 'scripts/updateK8SManifests.sh' and arguments 'vote \$(imageRepository) \$(tag)'. The right sidebar shows a list of tasks available for selection, including .NET Core, Android signing, Art, App Center distribute, App Center test, Archive files, ARM template deployment, Azure App Configuration Export, Azure App Configuration Import, Azure App Configuration Snapshot, Azure App Service deploy, Azure App Service manage, Azure App Service Settings, Azure CLI, Azure Container Apps Deploy, and Azure Database for MySQL deployment.

```

44
45
46
47
48
49
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51
52
53
54
55
56
57
58
59
60
61
62

```

The above Stage is automatically update the build number with tag deployment file argocd will pickup this changes.

Here we will get error imagepullbackoff as the azurecontainer register is private so we need create a secret a need mention that in deployment file with Imagepull secret

```
kubectl create secret docker-registry <secret-name> \
```

```
--namespace <namespace> \
```

```
--docker-server=<container-registry-name>.azurecr.io \
```

```
--docker-username=<service-principal-ID> \
```

```
--docker-password=<service-principal-password>
```

Here Container registry name

The screenshot shows the Azure portal interface for a container registry named 'azuredemoapp'. The 'vote' repository is selected, displaying a list of tags. The tags are sorted by last modified date, with the most recent tag being '15'.

Tags	Digest	Last modified
15	sha256:b066f6c9d622d56e87ea5f138335b1b536045d78e24e8798...	8/13/2025, 11:34 PM GMT+5:30
14	sha256:5c75f732116c00abe79c6dc57cdd024c3f2276157d2c4cfae39...	8/13/2025, 11:25 PM GMT+5:30
13	sha256:66142ddc15a9272dc57ebc3e1daa5261891a4d092271b621a3...	8/13/2025, 11:09 PM GMT+5:30
12	sha256:3deea5e21a20754e319214fd28967560d5788e32bba59ee055...	8/13/2025, 9:05 PM GMT+5:30
11	sha256:c08e82ebdffe9f2fa7c19ee34a02b64615d4408512dc2337a3d...	8/13/2025, 9:00 PM GMT+5:30
10	sha256:b299995f50aaa261c0ee76507423e5fbf75c88b6e81ac536af9a...	8/13/2025, 8:57 PM GMT+5:30
9	sha256:584d74a5f0ad746076a2d9695a58348ce149b70c4647c0aa1cb...	8/13/2025, 8:50 PM GMT+5:30
8	sha256:055876d02471ec3000e20e9d26dc25907574727b0ffa882b11d...	8/13/2025, 8:47 PM GMT+5:30
7	sha256:c4928e71f19b0773c43a095f8d7343a5542eb6c7eb57fe87ee4...	8/13/2025, 3:47 PM GMT+5:30

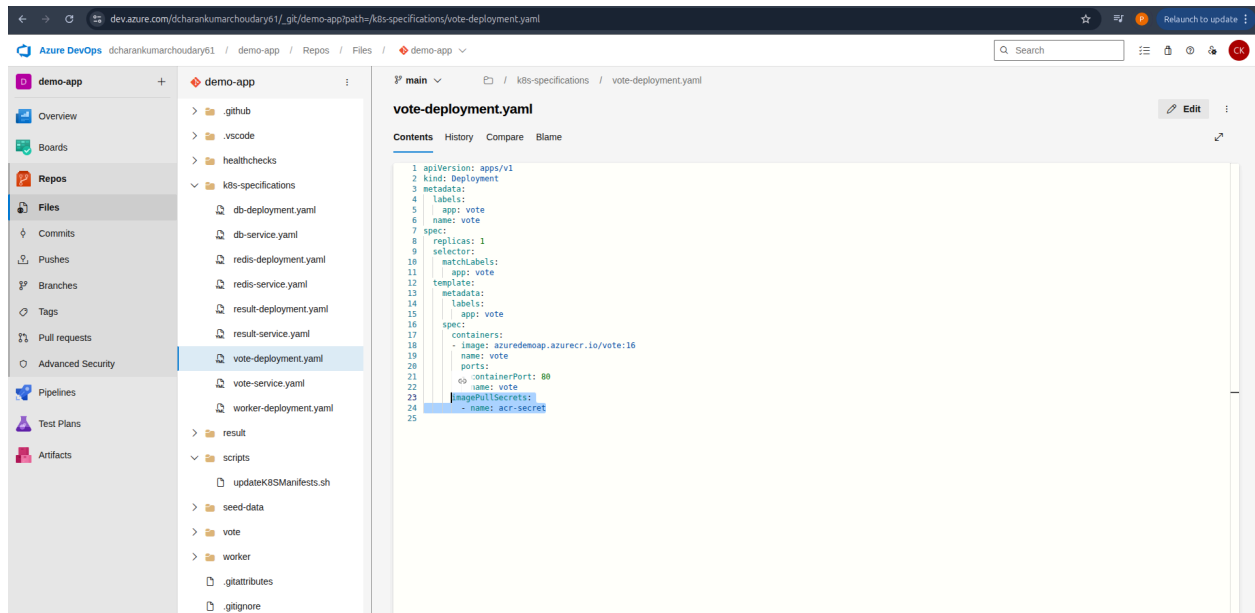
Need to generate the username and password

- Go to access key Need create a password .

The screenshot shows the 'Access keys' page for the 'azuredemoapp' container registry. The page displays the registry name, login server, admin user, and fields for generating a username and password. The 'password' and 'password2' fields are highlighted with a 'Show' button and a 'Regenerate' button.

Name	Password	Regenerate
password	Show
password2	Show

With this create a secret and mention the secret name in deployment.yaml file



I expose the svc as LB access the application using LB

