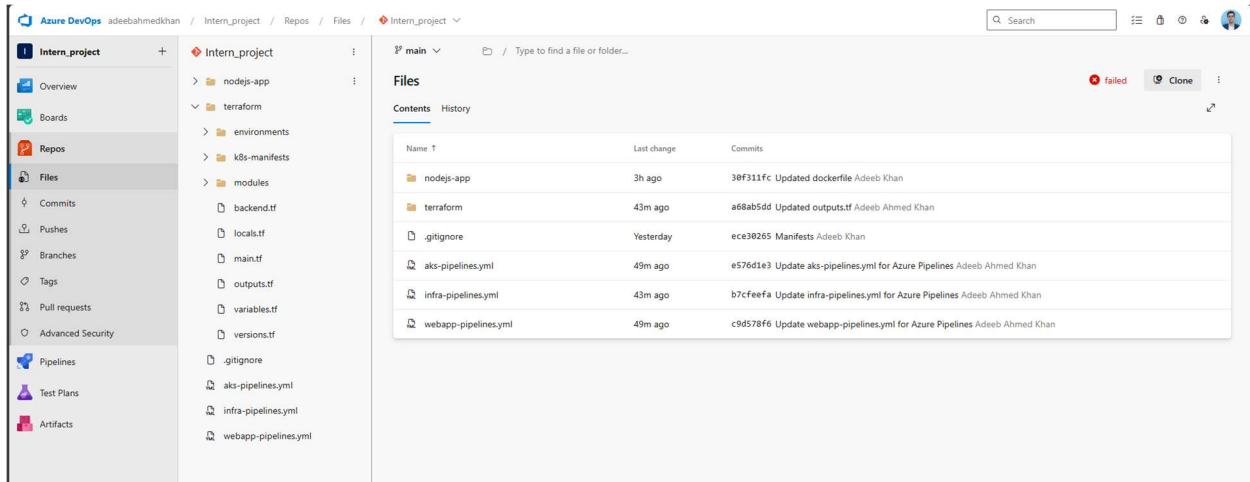


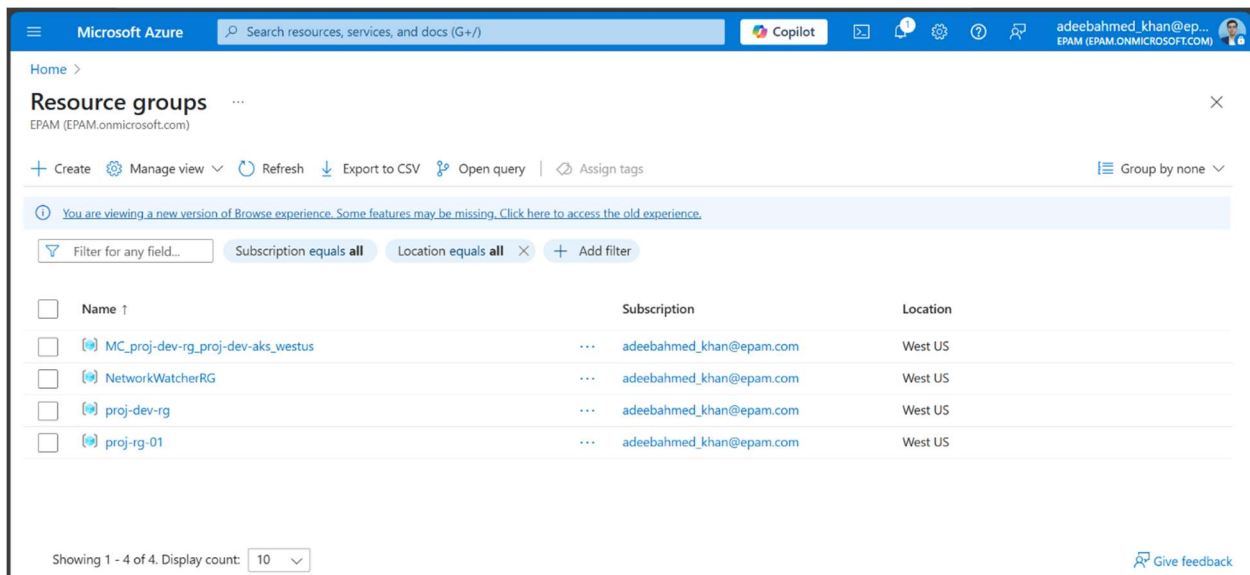
# Intern Project: Azure Cloud Infrastructure & CI/CD Implementation

## Task 1: Infrastructure Deployment with Terraform

### Repository structure on Azure DevOps portal:



### Resource groups created via pipeline:



**Backend storage container:**

Home > projstorage01

projstorage01 | Containers

Storage account

Search

Search containers by prefix

Only show active containers

Showing all 2 items

<input type="checkbox"/>	Name	Last modified	Anonymous access level	Lease state
<input type="checkbox"/>	\$logs	6/11/2025, 1:02:01 PM	Private	Available
<input type="checkbox"/>	tfstate	6/12/2025, 6:07:23 PM	Private	Available

**Environments configured:**

Run pipeline

Select parameters below and manually run the pipeline

Branch/tag

main

Select the branch, commit, or tag

Select environment to provision infrastructure

dev

dev

qa

staging

prod

Resources

Use latest version of all resources

## Successful execution of infrastructure pipeline (with manual validation on apply stage):

The screenshot shows the Azure DevOps interface for a pipeline named 'Format terraform' under the 'Intern\_project' repository. The pipeline is in a successful state, indicated by a green checkmark. The summary section shows it was manually run by Adeeb Ahmed Khan on June 12 at 8:03 PM, taking 18 minutes and 11 seconds. The stages section shows three stages: 'Terraform Init' (1 job completed, 42s), 'Terraform Plan' (1 job completed, 1m 1s), and 'Terraform Apply' (2 jobs completed, 16m 7s). The 'Terraform Apply' stage includes a manual validation step that passed.

**#20250612.12 • Format terraform**

This run will be cleaned up after 1 month based on your project settings.

**Summary** Code Coverage Terraform Plan

Manually run by Adeeb Ahmed Khan

Repository and version  
Intern\_project  
main be5f4cd6

Time started and elapsed  
Jun 12 at 8:03 PM  
18m 11s

Related  
0 work items  
0 artifacts

Tests and coverage  
Get started

**Stages** Jobs

**Terraform Init**  
1 job completed 42s

**Terraform Plan**  
1 job completed 1m 1s

**Terraform Apply**  
2 jobs completed 16m 7s  
1 manual validation passed

## Deployment of each resource:

The screenshot shows the Microsoft Azure portal interface for a resource group named 'proj-dev-rg'. The resource group is located in the West US region. The 'Resources' section lists 7 resources, including Key vault, App Service plan, Kubernetes service, SQL database, SQL server, App Service, and Container registry. The 'Tags' section shows the resource group is tagged with 'environment: dev', 'owner: adeebahmed\_khan@epam.com', and 'project: Azure Intern Project'.

**Microsoft Azure**

Search resources, services, and docs (G+I)

**proj-dev-rg**  
Resource group

Subscription (moved): adeebahmed\_khan@epam.com  
Subscription ID: 5cee968e-0ccf-40be-819c-34d922970b94  
Deployments: No deployments  
Location: West US  
Tags (edit): environment: dev, owner: adeebahmed\_khan@epam.com, project: Azure Intern Project

**Resources** Recommendations (1)

Filter for any field... Type equals all Location equals all Add filter

Showing 1 to 7 of 7 records. Show hidden types

Name	Type	Location
dev-ak-iv	Key vault	West US
dev-asp	App Service plan	West US
proj-dev-aks	Kubernetes service	West US
proj-dev-sqldb (proj-dev-sqlserver/proj-dev-sqldb)	SQL database	West US
proj-dev-sqlserver	SQL server	West US
proj-dev-webapp	App Service	West US
projdevacr	Container registry	West US

< Previous Page 1 of 1 Next >

Give feedback

## Task 2: CI/CD Pipeline Setup

### a) Web-app CI/CD:

#### Agents configured to execute jobs:

Default					Update all agents	New agent
Jobs	Agents	Details	Security	Approvals and checks	Analytics	
Name	Last run	Current status	Agent version	Enabled		
a94b43153bfe Online		Idle	4.258.1	On		
EPINHVDW13F4 Online	13m ago	Idle	4.255.0	On		

#### Successful execution of web-app pipeline (build and deployed via artifact):

Azure DevOps adeebahmedkhan / Intern\_project / Pipelines / webapp-pipeline / 20250619.1

#20250619.1 • Manifests  
webapp-pipeline

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

Summary Environments Code Coverage Associated pipelines

Manually run by Adeeb Ahmed Khan

Repository and version  
Intern\_project  
main ece30265

Time started and elapsed  
Yesterday at 8:57 PM  
3m 56s

Related  
0 work items  
1 published

Tests and coverage  
Get started

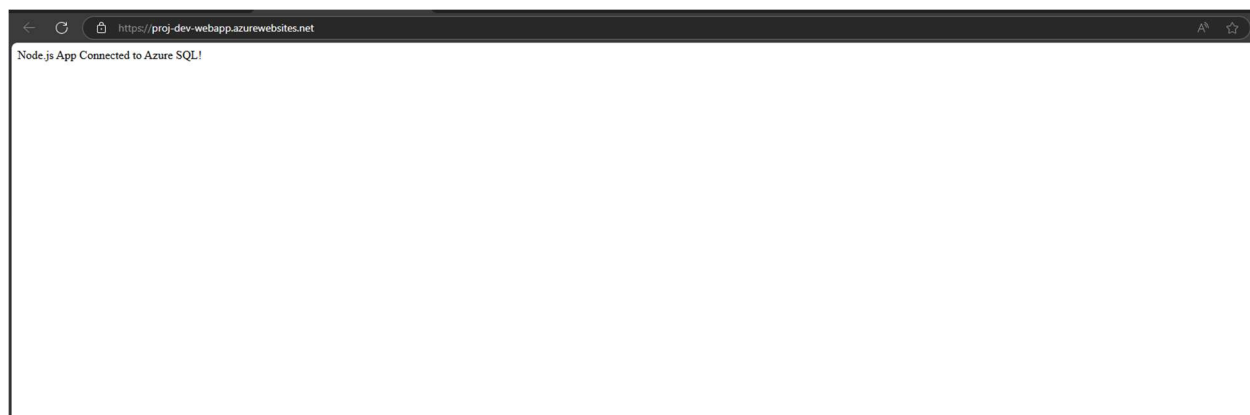
View 5 changes

Stages Jobs

Build application  
1 job completed 42s  
1 artifact

Deploy application  
1 job completed 3m 3s

#### Node.js web-app deployed on App Service (with database connection):



```
https://proj-dev-webapp.azurewebsites.net/Users

Pretty-print [x]

[
  {
    "UserID": 1,
    "FirstName": "Alice",
    "LastName": "Johnson",
    "Email": "alice.johnson@example.com",
    "DateOfBirth": "1990-05-12T00:00:00.000Z",
    "CreatedAt": "2025-06-17T13:59:25.410Z",
    "IsActive": true
  },
  {
    "UserID": 2,
    "FirstName": "Bob",
    "LastName": "Smith",
    "Email": "bob.smith@example.com",
    "DateOfBirth": "1985-09-23T00:00:00.000Z",
    "CreatedAt": "2025-06-17T13:59:25.410Z",
    "IsActive": true
  },
  {
    "UserID": 3,
    "FirstName": "Charlie",
    "LastName": "Brown",
    "Email": "charlie.brown@example.com",
    "DateOfBirth": "2000-01-15T00:00:00.000Z",
    "CreatedAt": "2025-06-17T13:59:25.410Z",
    "IsActive": true
  }
]
```

## b) Docker App to AKS - CI/CD:

Successful execution of aks pipeline (pushed image to ACR and deployed to AKS):

The screenshot displays the Azure DevOps interface for a pipeline named 'aks-pipeline'. The pipeline is in a 'Completed' state, indicated by a green checkmark. The summary section shows the pipeline was manually run by Adeeb Ahmed Khan. The stages section shows two stages: 'Build and Push Image...' and 'Deploy App to AKS', both of which completed successfully. The 'Build and Push Image...' stage shows 1 job completed in 30s with 1 artifact. The 'Deploy App to AKS' stage shows 1 job completed in 27s. The interface also includes a sidebar with navigation options like Overview, Boards, Repos, Pipelines, Environments, Library, Test Plans, and Artifacts.

**Azure DevOps** adeebahmedkhan / Intern\_project / Pipelines / aks-pipeline / 20250619.6

**#20250619.6 • Update aks-pipelines.yml for Azure Pipelines** [Run new](#)

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

**Summary** Environments Associated pipelines Code Coverage

Manually run by **Adeeb Ahmed Khan**

Repository and version: **Intern\_project** **main** **a36353ac**

Time started and elapsed: **Today at 10:26 PM** **1m 30s**

Related: **0 work items** **1 published**

Tests and coverage: **Get started** [View 49 changes](#)

**Stages** **Jobs**

**Build and Push Image...** 1 job completed 30s 1 artifact

**Deploy App to AKS** 1 job completed 27s

## AKS utilities:

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and the user profile 'adeebahmed\_khan@ep...'. The main content area displays the resource group 'MC\_proj-dev-rg\_proj-dev-aks\_westus'. A sidebar on the left lists various Azure services like Activity log, Access control (IAM), Tags, Resource visualizer, Events, Settings, Cost Management, Monitoring, Automation, and Help. The main pane shows a list of resources with columns for Name, Type, and Location. The resources listed are:

Name	Type	Location
aks-agentpool-49379515-nsg	Network security group	West US
aks-system-17972270-vmss	Virtual machine scale set	West US
aks-vnet-49379515	Virtual network	West US
azurekeyvaultsecretsprovider-proj-dev-aks	Managed Identity	West US
kubernetes	Load balancer	West US
kubernetes-aaa9e5ac88ee04750a2fb020f051d90c	Public IP address	West US
proj-dev-aks-agentpool	Managed Identity	West US

## Image pushed to ACR repository:

The screenshot shows the 'projdevacr | Repositories' page in the Microsoft Azure portal. The left sidebar lists various services like Overview, Activity log, Access control (IAM), Tags, Quick start, Resource visualizer, Events, Settings, Services, Repositories, Webhooks, and Geo-replications. The main pane displays the 'projdevacr | Repositories' page, which includes a search bar and a list of repository tags. The tags are listed with columns for Tag, Digest, and Last modified. The tags are:

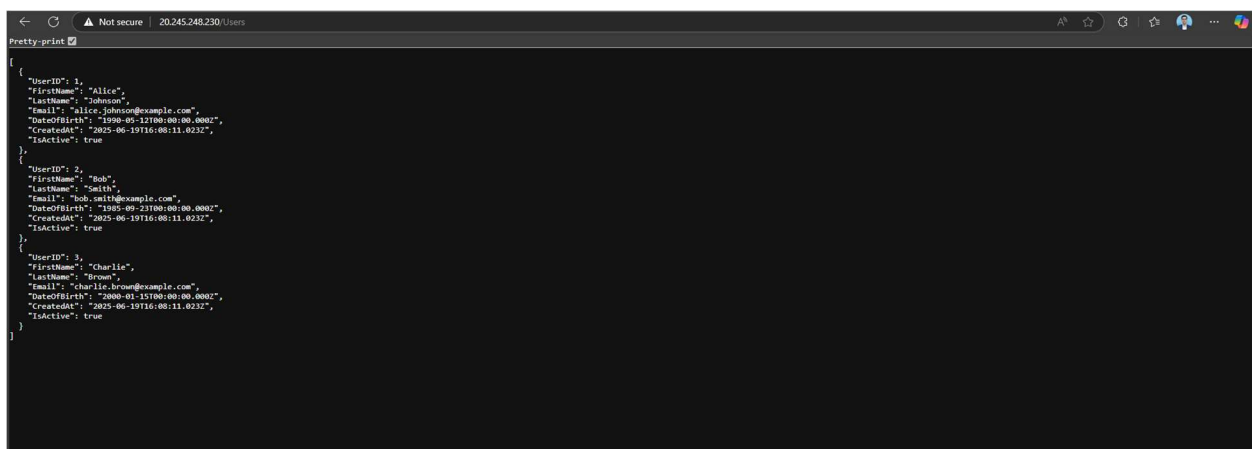
Tag	Digest	Last modified
79	sha256:2764bef08c50344b9337a43d05770dd05292af6737b8fa02c2...	6/20/2025, 12:24 PM GMT+5:30
78	sha256:ef477e73e7702ba2d09faec3e553a240a67b41118d9595509f...	6/20/2025, 12:11 PM GMT+5:30
77	sha256:b362c4d79f5705ef4d6c89f8a4905b74267c5173ebc08799832e...	6/20/2025, 12:00 PM GMT+5:30
76	sha256:358381eb4460a77f1398195d6e4debe4021cb7bf5ea4806889a...	6/20/2025, 3:31 AM GMT+5:30
75	sha256:5d7467a11d88140447548b80fe3a21bf063f6b06d9f60e45528...	6/20/2025, 1:37 AM GMT+5:30
74	sha256:6455a951126f05772469df7b1c174425924c9a287f024488fe...	6/20/2025, 1:33 AM GMT+5:30

## Pod up and running:

The screenshot shows the 'nodes-app | Overview' page in the Microsoft Azure portal. The left sidebar lists various services like Overview, Events, Live logs, and Workloads. The main pane displays the 'nodes-app | Overview' page, which includes a search bar and a list of pod details. The pod details are listed with columns for Pod name, Status, Restart count, Age, CPU, Memory, Node, and Pod IP. The pod details are:

Pod name	Status	Restart count	Age	CPU	Memory	Node	Pod IP
nodes-app-b443d3c1-df9c	Running	0	5 minutes	0%	0%	aks-system-179...	10.244.0.219

## App deployed to AKS:



## Branch policies for approval:

