



Microsoft Azure Mini Project

Group Members:-

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Microsoft
Future Ready Talent
Internship

The graphic features a central purple globe with a pink base, surrounded by four stylized human figures in business attire. One figure stands on the left, another on the right, and two are positioned in front of the globe. They are interacting with various floating digital screens displaying icons like a magnifying glass, a bar chart, and a gear. The background is white with a light gray diagonal band on the right side containing the text.

Title: “Efficient CI/CD Pipeline for Azure Web App Deployment.”

Overview:

The project focuses on solving the problem of manual and error-prone deployment processes for web applications on the Azure platform. It addresses the need for a streamlined, efficient, and reliable deployment workflow.

Core Features:

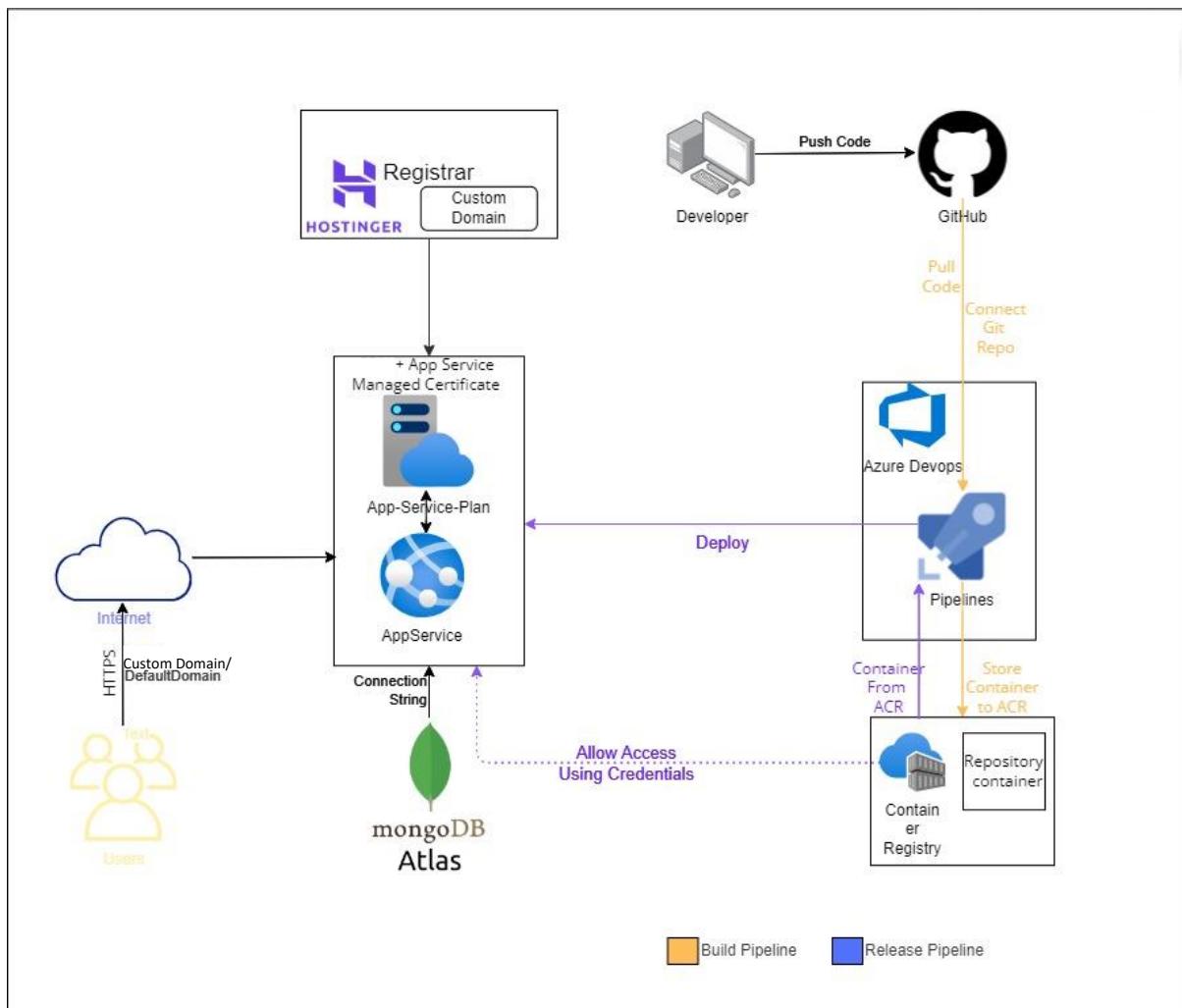
Continuous Integration and Continuous Deployment (CI/CD): The project implements a robust CI/CD pipeline that automates the deployment process. Developers push code changes to a GitHub repository, triggering a series of automated actions that build a Docker container of the web application, store it in an Azure Container Registry (ACR), and deploy it to an Azure App Service.

Azure Services Utilized:

1. **Azure Container Registry (ACR):** Used for storing and version-controlling Docker container images.
2. **Azure App Service:** The platform where the web application is hosted, offering auto-scaling and load balancing.
3. **Azure DevOps Integration:** Azure DevOps is used to set up the build and release pipelines, ensuring the seamless automation of the CI/CD process.
4. **Custom Domain:** The project enables access to the web application via a custom domain, leveraging Azure DNS for domain management and resolution.

The project's purpose is to streamline web application deployment on Azure, making it more efficient, reliable, and error-free. It offers developers a solution that minimizes manual deployment efforts, accelerates the release cycle, and ensures consistent and hassle-free updates and new feature deployments. The integration of multiple Azure services and DevOps practices makes this project a powerful and comprehensive solution for Azure-based web application deployment.

Flow Chart:



Explanation:

This project involves creating a seamless deployment pipeline for a web application. It leverages Microsoft Azure services, including Azure Container Registry (ACR), Azure App Service, and Azure DevOps. Here's a breakdown of the key components and steps:

1. Azure Container Registry (ACR): An ACR repository is set up to store Docker containers of the web application. It will store the containers created by build pipeline.
2. GitHub Repository: The project code is stored in a GitHub repository, providing version control and collaboration capabilities.
3. Azure DevOps: Azure DevOps is utilized to automate the build and release processes.

4. Build Pipeline: A build pipeline is created in Azure DevOps, which compiles the project code from the GitHub repository, packages it into a Docker container, and stores the container in ACR.
5. Azure App Service: An Azure App Service is configured to host the web application using Docker containers. This service provides a scalable and cost-effective hosting solution, as per the requirement I will not be using auto scaling.
6. Deployment Center: The deployment center is accessed from the Azure portal it is the part of App Service from where I can manually deploy the container stored in ACR on the App Service.
7. Release Pipeline: A release pipeline in Azure DevOps automates the deployment of the web application. Whenever changes are committed to the master branch in GitHub, the build and release processes are triggered automatically.

By automating these processes, the project enhances efficiency, reduces human errors, and allows for easy scaling and continuous integration. The project serves as a model for streamlined web application deployment using Azure services.

Problem Statement:

The project aims to address the challenge of manual and error-prone deployment processes for web applications on the Azure platform. Inefficient deployment practices often result in delays and issues in delivering updates and new features to end-users. This project identifies the problem of manual deployment and seeks to solve it through the implementation of a streamlined Continuous Integration and Continuous Deployment (CI/CD) pipeline. By automating the deployment process, the project mitigates deployment errors, enhances delivery speed, and promotes a more reliable and efficient web application deployment on Azure. This addresses the existing problem of manual and error-prone deployments and offers an opportunity to significantly improve the deployment workflow for web applications hosted on Azure.

Project Description:

The core idea behind this project is to address the problem of manual and error-prone deployment processes for web applications on the Azure platform. We are leveraging Azure's robust feature set to create an automated Continuous Integration and Continuous Deployment (CI/CD) pipeline. This project targets developers and development teams looking to streamline their web application deployment on Azure.

The problem we are solving is the inefficiency of manual deployments, which often lead to delays, errors, and inconsistencies in the release of updates and new features. By implementing an automated CI/CD pipeline, we are mitigating this problem. Our project allows developers to push their code changes to a GitHub repository, and from there, Azure DevOps takes over. It builds a Docker container of the web application, stores it in an Azure Container Registry (ACR), and then deploys it to an Azure App Service. This automated pipeline ensures that the deployment process is error-free and rapid.

Our project addresses the clear need for efficient, reliable, and consistent web application deployment on Azure. By automating the process, it not only eliminates manual errors but also accelerates the release cycle. The purpose and basic functionality of our project are closely aligned with the problem statement, offering a systematic solution that enables developers to focus on coding while the CI/CD pipeline takes care of deployment intricacies.

core Azure services:

1. Azure Container Registry (ACR): ACR is the foundation for storing Docker container images, enabling us to efficiently manage and distribute containerized applications. We use ACR to store and version control our application's container images.
2. Azure App Service: Azure App Service is the platform where we host and run our web application. It provides a managed environment for web app deployment, including auto-scaling, load balancing, and seamless integration with our Docker containers stored in ACR.

Additional Azure Services:

1. Azure DevOps: While not a core Azure service, Azure DevOps plays a crucial role in this project. It is used for setting up the build and release pipelines, automating the CI/CD process, and connecting various components of the project together.
2. DNS (for Custom Domain): The project enables access to the web application via a custom domain, mapping a custom domain name to app service and using App Service Managed Certificate.
3. App Service Managed Certificate: Providing SSL certificates for secure communication with the custom domain..

Complete Step By Step Process:

1. Create Container Repository

Project details

Subscription * Azure for Students

Resource group * (New) FRTProjectCICD

Registry name * ContainerRegistryBlogWeb

Location * Central India

Use availability zones

Pricing plan * Standard

Validation passed

Networking

Public network access Yes

Validation passed

A Microsoft.Conta x Learning | Future x Projects - Home x Azure Container x G container regist x Registry service x SKstudies/Blogs x +

portal.azure.com/#view/HubsExtension/DeploymentDetailsBlade/~/overview/id/%2Fsubscriptions%2Fb858338e-efa7-486d-aebd-c1573aab0e40%2Fresource... D : ;

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Microsoft Azure Search resources, services, and docs (G+) diveshkkolhe@gmail.com DEFAULT DIRECTORY (DIVESHK)

Home > Microsoft.ContainerRegistry | Overview x ...

Deployment

Search < Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

Your deployment is complete

Deployment name : Microsoft.ContainerRegistry
Subscription : Azure for Students
Resource group : FRTProjectCICD

Start time : 10/25/2023, 1:22:23 PM
Correlation ID : 651176d8-a014-4abc-9ee5-3dbc60018c17

Deployment details

Resource	Type	Status	Operation details
ContainerRegistryBlogWeb	Container registry	OK	Operation details

Next steps

[Go to resource](#)

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Type here to search

01:26 PM 25-10-2023 ENG

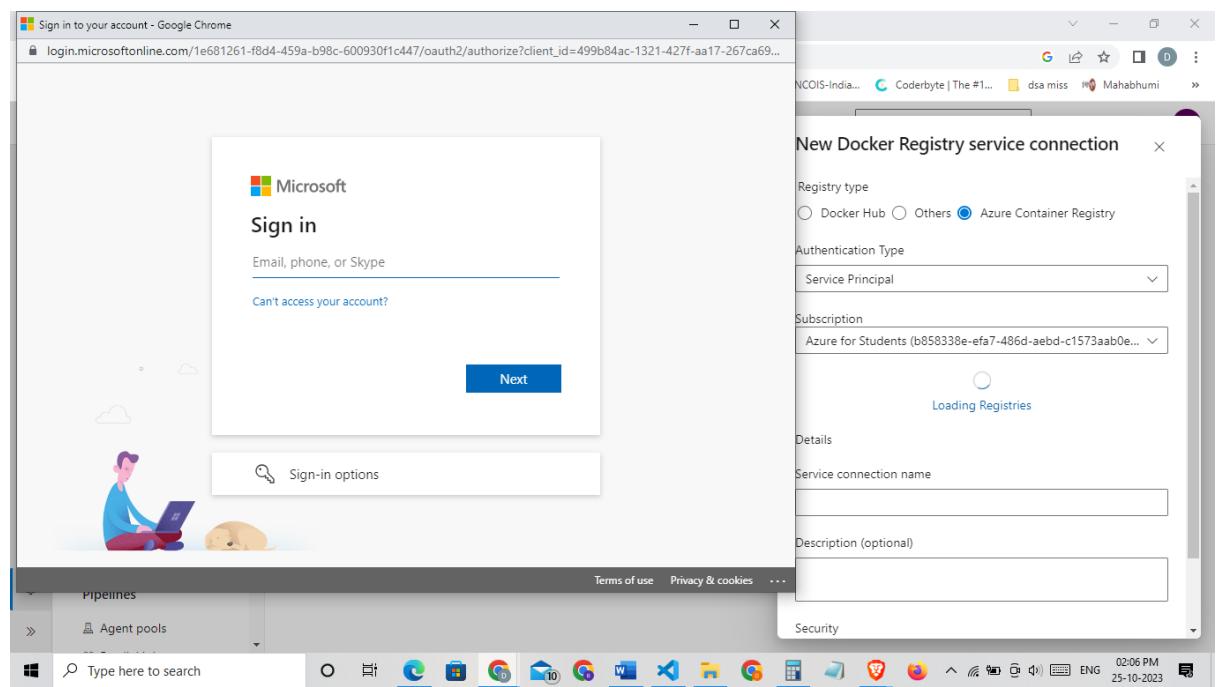
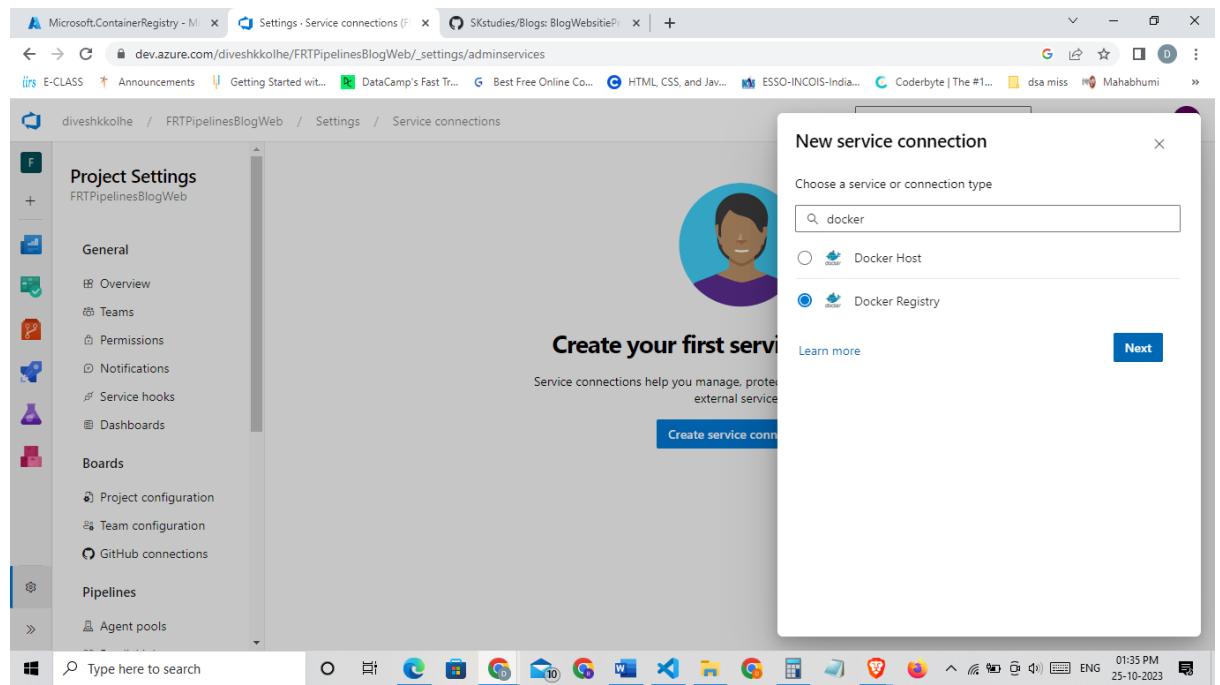
2. Create Service Connections From Devops To Github and ACR

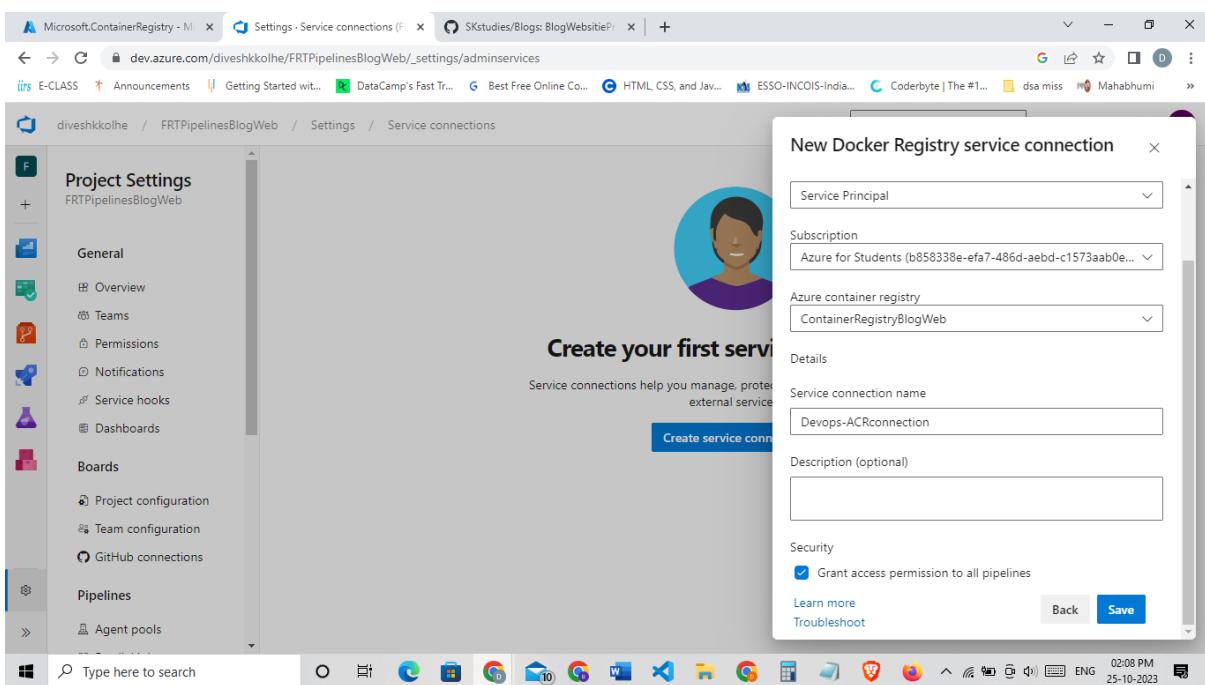
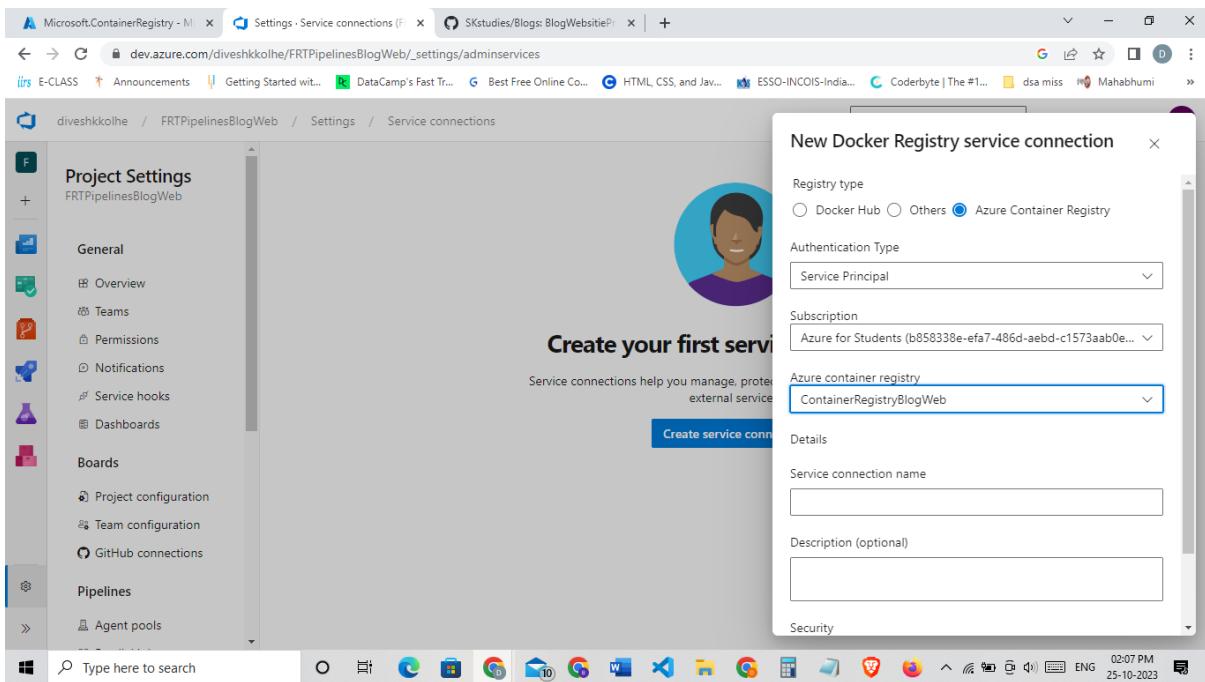
The screenshot shows the Azure DevOps interface with the following details:

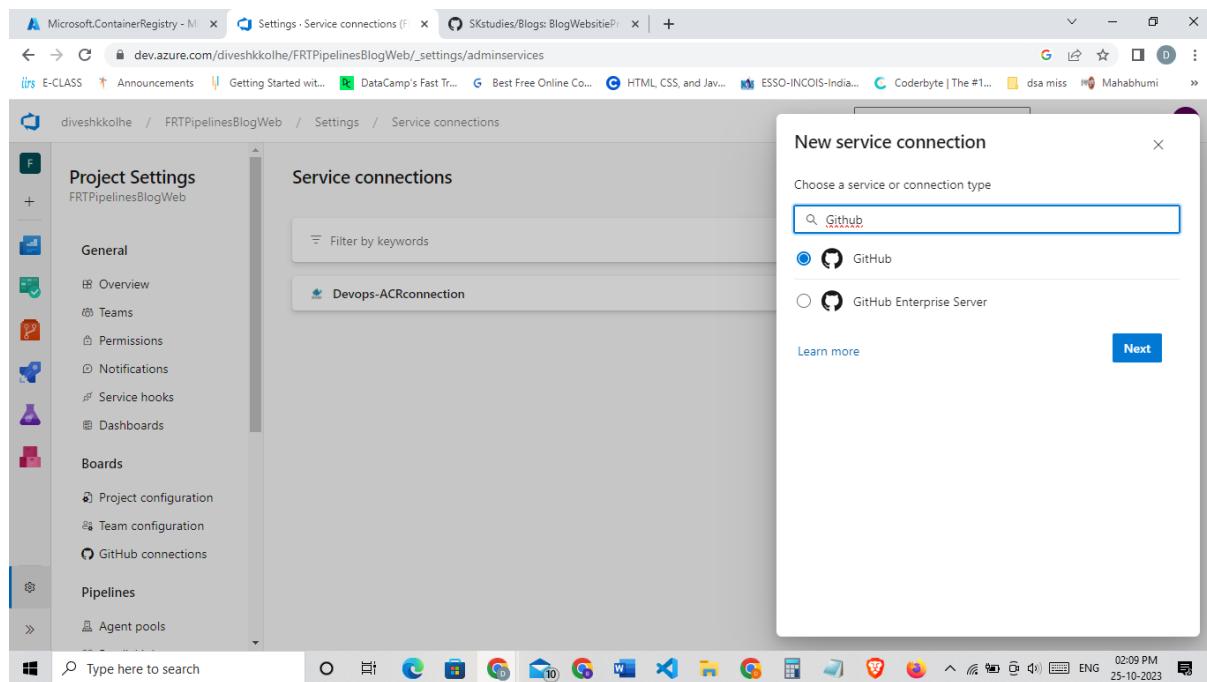
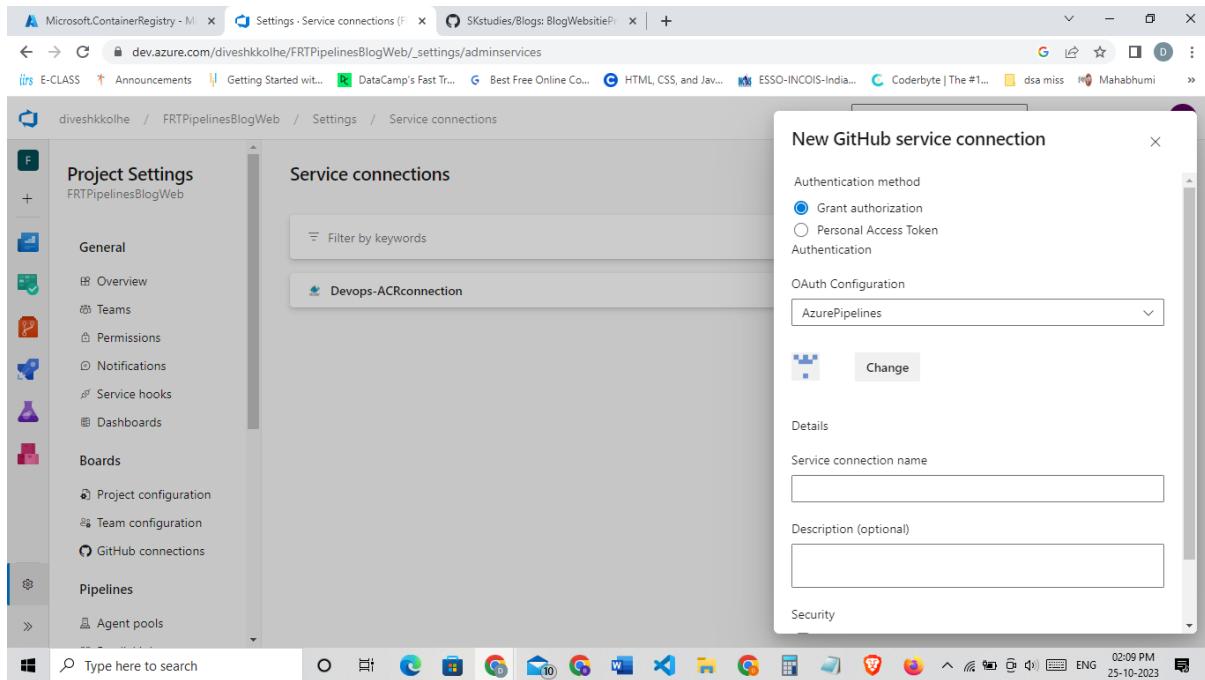
- Top Bar:** Microsoft.ContainerRegistry - M, Projects - Home, dev.azure.com/diveshkkkolhe/, SKStudies/Blogs: BlogWebsitePi..., +, G, L, Star, D, More.
- Header:** Azure DevOps, Search bar, Filter projects.
- Sidebar:** New organization, Organization settings.
- Project List:** Pipeline1 (selected).
- Create new project Dialog:**
 - Name:** FRTpipelinesBlogWeb
 - Description:** (Empty)
 - Visibility:** Public (disabled) vs Private (selected).

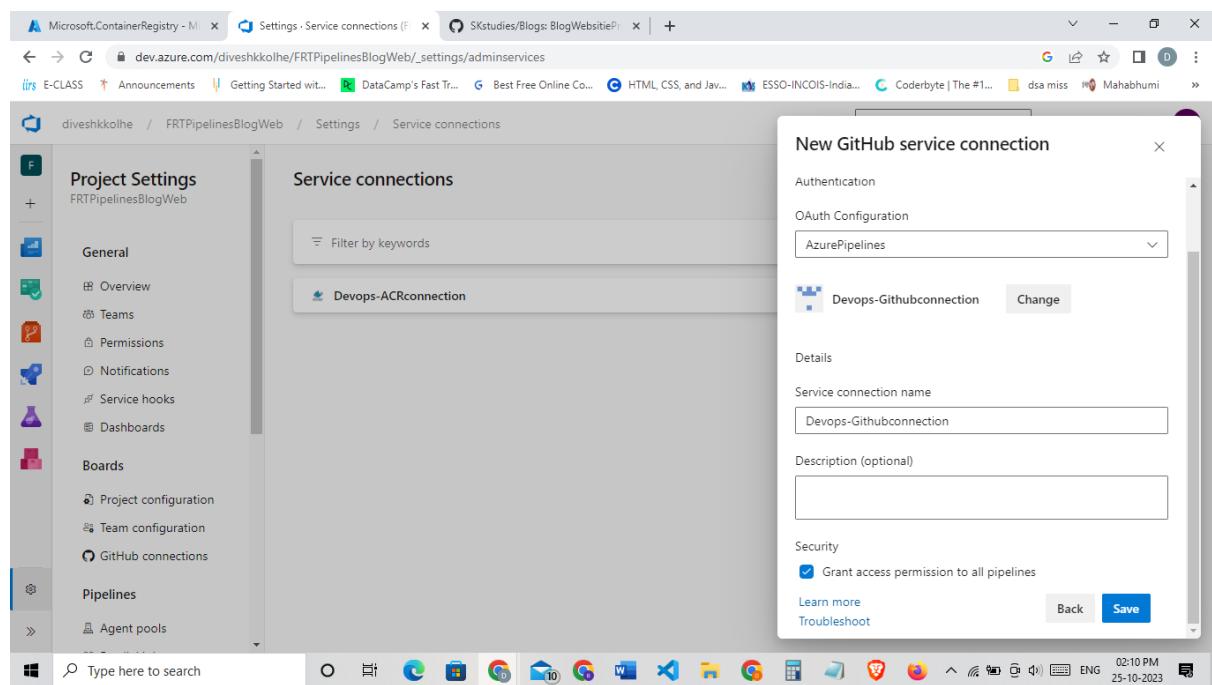
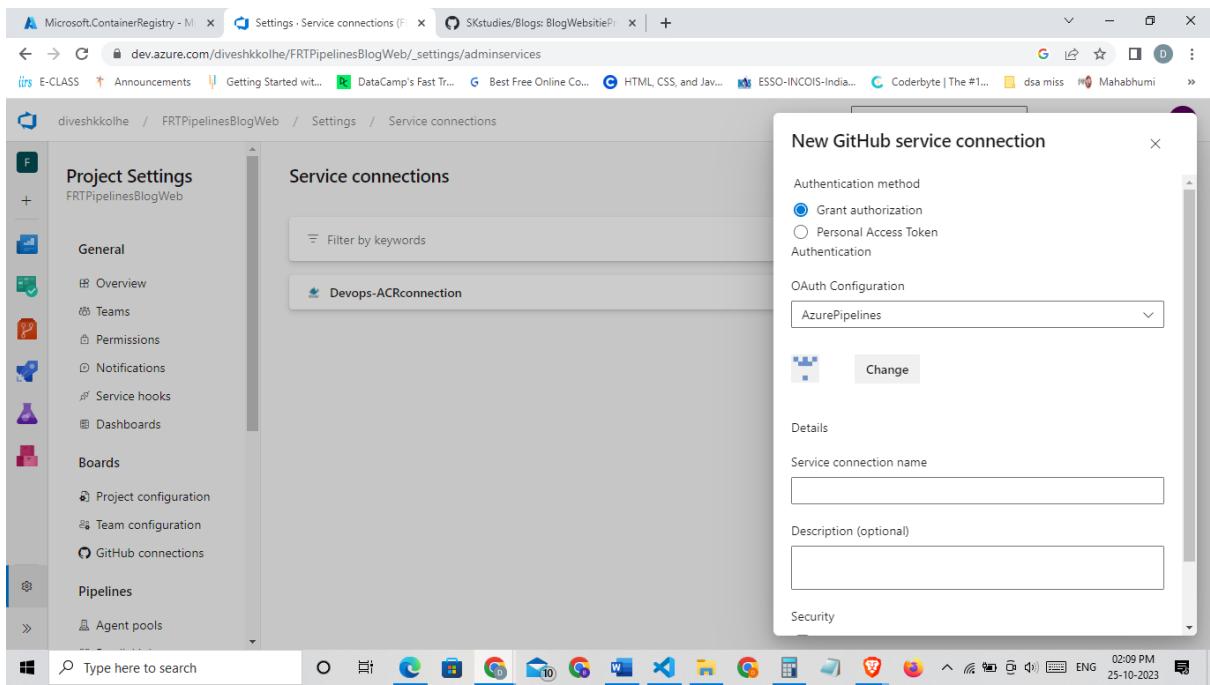
Public: Anyone on the internet can view the project. Certain features like TFS are not supported.

Private: Only people you give access to will be able to view this project.
 - Note:** Public projects are disabled for your organization. You can turn on public visibility with [organization policies](#).
 - Advanced:** (button)
 - Buttons:** Cancel, Create.
- Bottom Bar:** Type here to search, Taskbar icons, ENG, 01:33 PM, 25-10-2023.

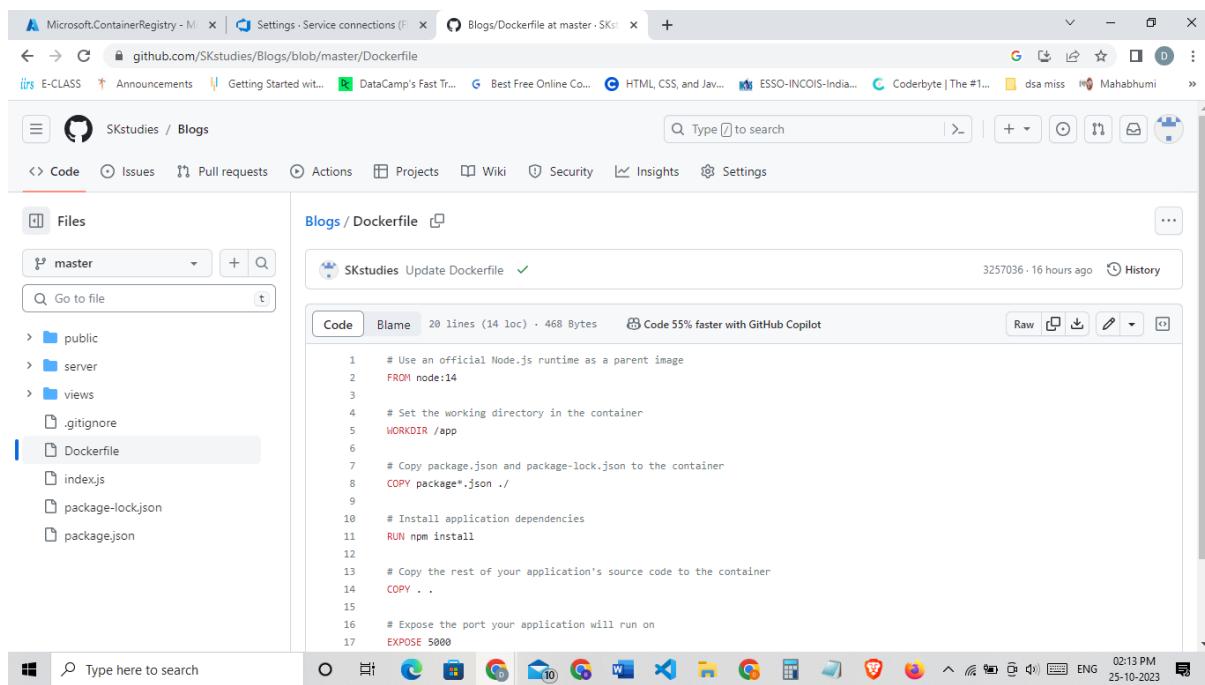
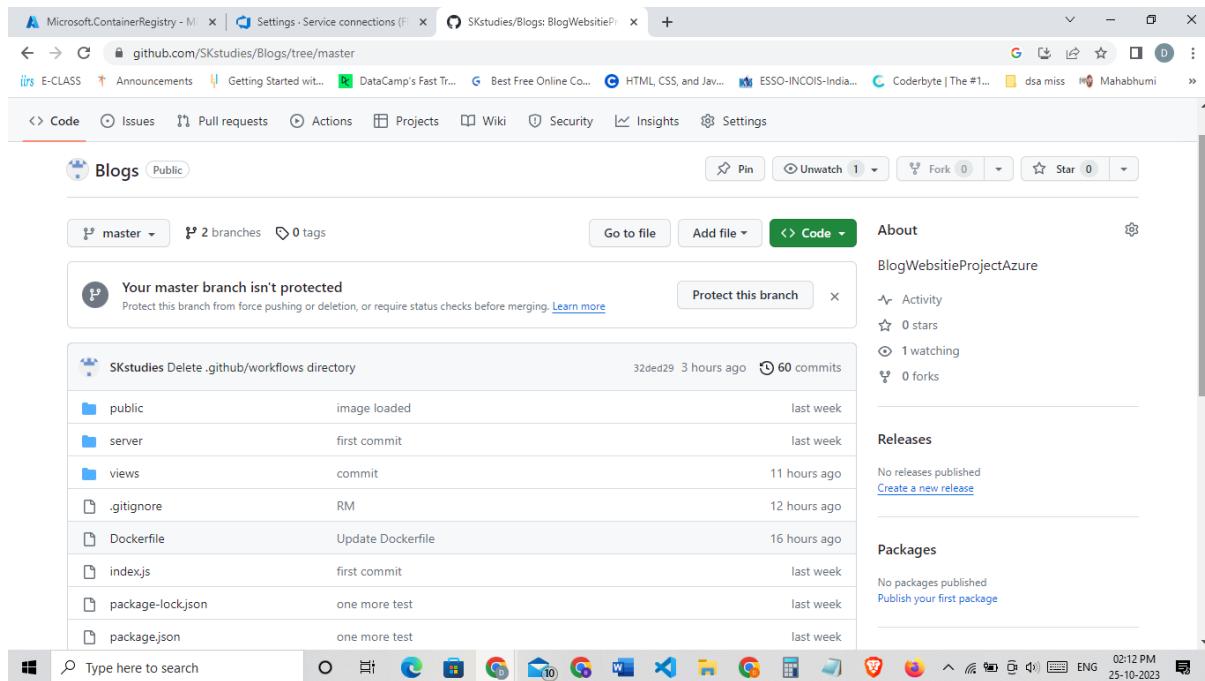








3. Push The Code To Github Repo Which Should Contain the Required Docker File.



4. Create Build Pipeline.

The screenshot shows the Azure DevOps Pipelines interface. The left sidebar has a 'Pipelines' section with several options: Overview, Boards, Repos, Pipelines (selected), Environments, Releases, Library, Task groups, Deployment groups, and Test Plans. The main area features a cartoon illustration of a person working at a laptop, a dog, and a robot. Below the illustration, the text 'Create your first Pipeline' is displayed, followed by the sub-instruction 'Automate your build and release processes using our wizard, and go from code to cloud-hosted within minutes.' A prominent blue 'Create Pipeline' button is centered. At the bottom of the screen, a taskbar shows various application icons, and the system tray indicates the date and time as 25-10-2023 at 02:14 PM.

This screenshot is identical to the one above, showing the 'Create your first Pipeline' wizard in the Azure DevOps Pipelines interface. The left sidebar is the same, and the main area features the same cartoon illustration and instructions. The taskbar and system tray at the bottom are also identical, showing the date and time as 25-10-2023 at 02:14 PM.

Microsoft.ContainerRegistry - M New pipeline - Pipelines SKstudies/Blogs: BlogWebsiteP... +

dev.azure.com/diveshkkolhe/FRTPIPipelinesBlogWeb/_apps/hub/ms.vss-build-web.ci-designer-hub

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Azure DevOps diveshkkolhe / FRTPIPipelinesBlogWeb / Pipelines

Search

Connect Select Configure Review

New pipeline

Where is your code?

Azure Repos Git YAML
Free private Git repositories, pull requests, and code search

Bitbucket Cloud YAML
Hosted by Atlassian

GitHub YAML
Home to the world's largest community of developers

GitHub Enterprise Server YAML
The self-hosted version of GitHub Enterprise

Overview Boards Repos Pipelines Environments Releases Library Task groups Deployment groups Test Plans Project settings

Type here to search

This screenshot shows the 'New pipeline' screen in Azure DevOps. The left sidebar lists project navigation items such as Overview, Boards, Repos, Pipelines, Environments, Releases, Library, Task groups, Deployment groups, Test Plans, and Project settings. The main area is titled 'Where is your code?' and displays a list of integration providers: Azure Repos Git (YAML), Bitbucket Cloud (YAML), GitHub (YAML), and GitHub Enterprise Server (YAML). The GitHub option is currently selected. Below the providers, there is a search bar and a taskbar at the bottom.

Microsoft.ContainerRegistry - M New pipeline - Pipelines New pipeline - Pipelines +

dev.azure.com/diveshkkolhe/FRTPIPipelinesBlogWeb/_apps/hub/ms.vss-build-web.ci-designer-hub?triggers=ContinuousIntegration%2CPullRequest&telemetrySessionId=10000000000000000000000000000000

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Azure DevOps diveshkkolhe / FRTPIPipelinesBlogWeb / Pipelines

Search

✓ Connect Select Configure Review

New pipeline

Select a repository

Filter by keywords

SKstudies/Blogs Oct 15

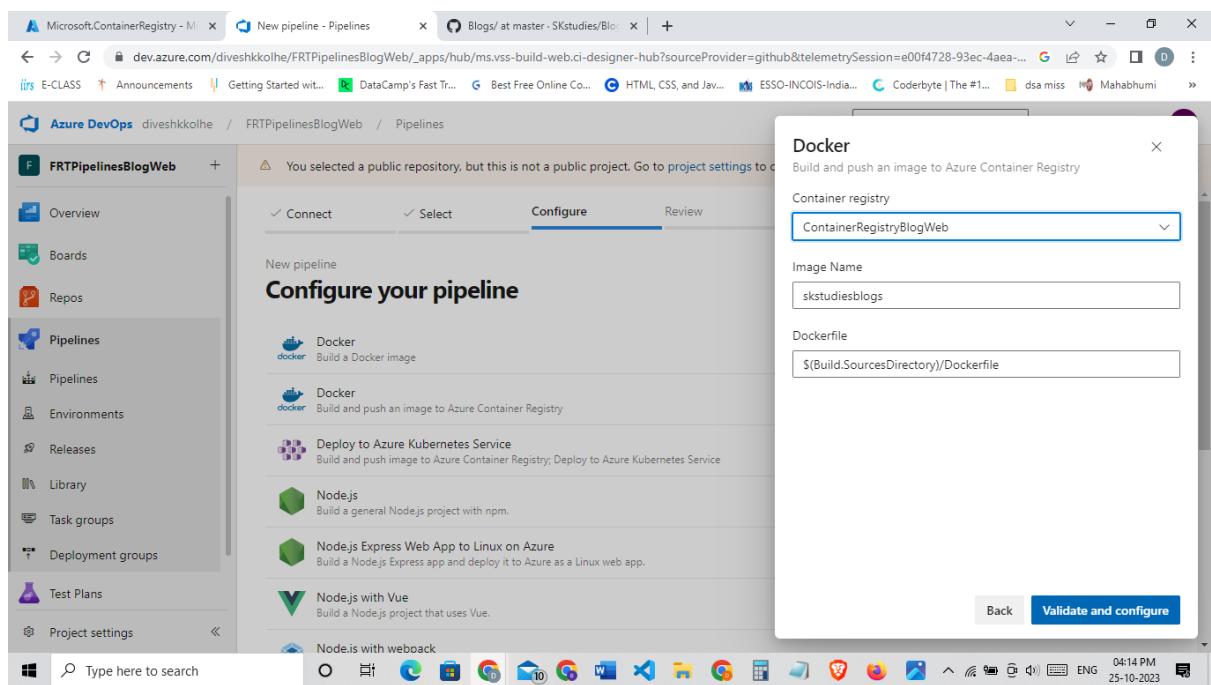
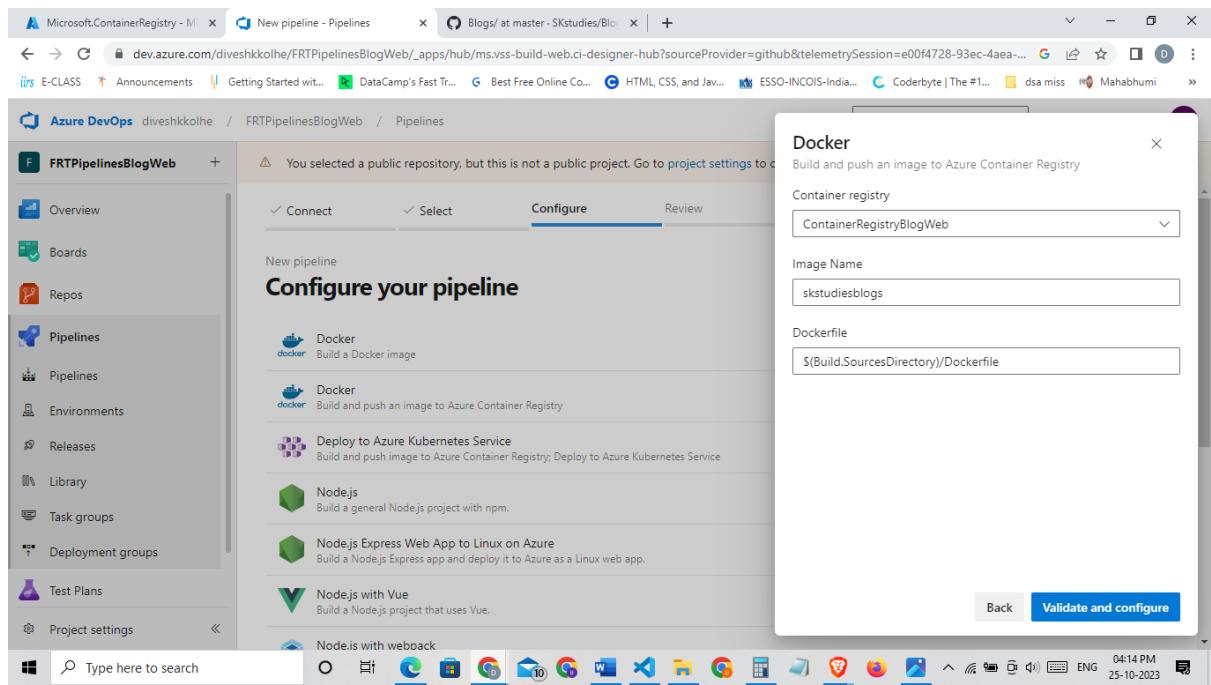
SKstudies/ap Oct 15, 2023 at 10:20 AM GMT+5:30 Oct 6

Showing the most recently used repositories where you are a collaborator.
If you can't find a repository, make sure you provide access.
You may also select a specific connection.

Overview Boards Repos Pipelines Environments Releases Library Task groups Deployment groups Test Plans Project settings

Type here to search

This screenshot shows the 'Select a repository' screen in Azure DevOps. The left sidebar is identical to the previous screenshot. The main area is titled 'Select a repository' and shows a list of repositories under the heading 'Filter by keywords'. Two repositories are listed: 'SKstudies/Blogs' (last updated Oct 15) and 'SKstudies/ap' (last updated Oct 6, highlighted with a black background). A note below the list states: 'Showing the most recently used repositories where you are a collaborator. If you can't find a repository, make sure you provide access. You may also select a specific connection.' The bottom of the screen features a search bar and a taskbar.



The screenshot shows the Azure DevOps Pipelines interface for a project named "FRTpipelinesBlogWeb". The left sidebar is visible with options like Overview, Boards, Repos, Pipelines, Environments, Releases, Library, Task groups, Deployment groups, Test Plans, and Project settings. The main area is titled "Review your pipeline YAML" and displays the following YAML code:

```
1 # Docker
2 # Build and push an image to Azure Container Registry
3 # https://docs.microsoft.com/azure/devops/pipelines/languages/docker
4
5 trigger:
6 - master
7
8 resources:
9 - repo: self
10
11 variables:
12 # Container registry service connection established during pipeline creation
13 dockerRegistryServiceConnection: 'e84362bd-f59e-4718-a3ab-87aca529528c'
14 imageRepository: 'skstudieblogs'
15 containerRegistry: 'containerregistryblogweb.azurecr.io'
16 dockerfilePath: '${Build.SourcesDirectory}/Dockerfile'
```

Below the code, there are buttons for "Variables", "Save and run", and a dropdown menu. The status bar at the bottom right shows "04:15 PM 25-10-2023".

The screenshot shows the same Azure DevOps Pipelines interface as above, but with a modal dialog box titled "Save and run" overlaid. The dialog contains the following fields:

- Commit message: "Set up CI with Azure Pipelines"
- Optional extended description: "Add an optional description..." (empty)
- Commit options:
 - Commit directly to the master branch
 - Create a new branch for this commit
- A "Save and run" button at the bottom right of the dialog.

The rest of the interface and status bar are identical to the first screenshot.

The screenshot shows the Azure DevOps Pipelines interface for a project named "FRTpipelinesBlogWeb". On the left, the navigation bar has "Pipelines" selected. The main area displays a "Review your pipeline YAML" section with the following YAML code:

```
1  # Docker
2  # Build and push an image to Azure Container Registry
3  # https://docs.microsoft.com/azure/devops/pipelines/languages/docker
4
5  trigger:
6  - master
7
8  resources:
9  - repo: self
10
11 variables:
12   # Container registry service connection established during pipeline
13   dockerRegistryServiceConnection: 'e84362bd-f59e-4718-a3ab-87aca529'
14   imageRepository: 'skstudieblogs'
15   containerRegistry: 'containerregistryblogweb.azurecr.io'
16   dockerfilePath: '${Build.SourcesDirectory}/Dockerfile'
```

To the right, a "Save and run" dialog box is open, containing fields for "Commit message" (Set up CI with Azure Pipelines), "Optional extended description" (Add an optional description...), and two radio button options: "Commit directly to the master branch" (selected) and "Create a new branch for this commit". A "Save and run" button is at the bottom right of the dialog.

The screenshot shows the Azure DevOps Pipelines interface for the same project. The navigation bar has "Pipelines" selected. The main area displays the "Jobs in run #20231025.1" section under "SKstudie.Blogs". The "Build" stage is expanded, showing its steps and their durations:

- Initialize job: <1s
- Checkout SKstudie.Blo...: 2s
- Build and push an ...: 2m 14s
- Post-job: Checkout SKSt...: 1s
- Finalize Job: <1s

A "View raw log" button is located at the top right of the log pane. The status of the build stage is "Build" with a green checkmark.

5. Docker Container Created In The Repository.

The screenshot shows the Microsoft Azure portal interface. The user is navigating through 'Container registries' and has selected 'ContainerRegistryBlogWeb | Repositories'. On the left sidebar, under 'Services', 'Repositories' is highlighted. The main pane displays a repository named 'skstudieblogs'. The 'Essentials' section shows a single tag ('1'), a manifest count of 1, and a last updated date of 10/25/2023, 4:17 PM GMT+5:30. Below this, a table lists 24 tags, each with a digest and a last modified timestamp of 10/25/2023, 4:17 PM GMT+5:30. The top right corner of the main pane shows the user's email address: 'diveshkkolle@gmail.com' and 'DEFAULT DIRECTORY DIVSHK...'.

6. Allow Access.

The screenshot shows the Microsoft Azure portal interface. The user is navigating through 'Container registries' and has selected 'ContainerRegistryBlogWeb | Access keys'. On the left sidebar, under 'Services', 'Access keys' is highlighted. The main pane displays the access key settings for 'ContainerRegistryBlogWeb'. It shows the 'Registry name' as 'ContainerRegistryBlogWeb', 'Login server' as 'containerregistry.blogweb.azurecr.io', and an 'Admin user' checkbox which is checked. The 'Username' field contains 'ContainerRegistryBlogWeb'. Two password fields are present: 'password' with value 'I7ROOQGik2oBOG1s1XMvrqjLSKwOARxFYlt2ewC3Qp+AC...' and 'password2' with value 'V3LRGfBtntpst3EFt7z4H0thaZqj2198We+Ptlu+ACRC+7...'. A message bubble in the top right corner says: 'Admin user activated' and 'ContainerRegistryBlogWeb' is now an admin. The top right corner of the main pane shows the user's email address: 'diveshkkolle@gmail.com' and 'DEFAULT DIRECTORY DIVSHK...'.

7. Create Web App.

App Services - Microsoft Azure | Pipelines - Run 20231025.1 logs | Blogs/ at master · SKstudies/Blo... | +

portal.azure.com/#view/HubsExtension/BrowseResource/resourceType/Microsoft.Web%2Fsites

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Home > App Services

Default Directory

+ Create Manage Deleted Apps Manage view Refresh Export to CSV Open query Assign tags Start Restart Stop Delete

Filter for any field... Subscription equals all Resource group equals all Location equals all Add filter

Showing 0 to 0 of 0 records.

Name ↑ Status ↑ Location ↑ Pricing Tier ↑ App Service Plan ↑ Subscription ↑ App Type ↑

No grouping List view

No app services to display

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portal.azure.com/#create/Microsoft.WebSite

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Microsoft Azure Search resources, services, and docs (G+ /)

Home > App Services > Create Web App

Project Details

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * Azure for Students

Resource Group * FRTProjectCICD

Name * BlogAppFRT

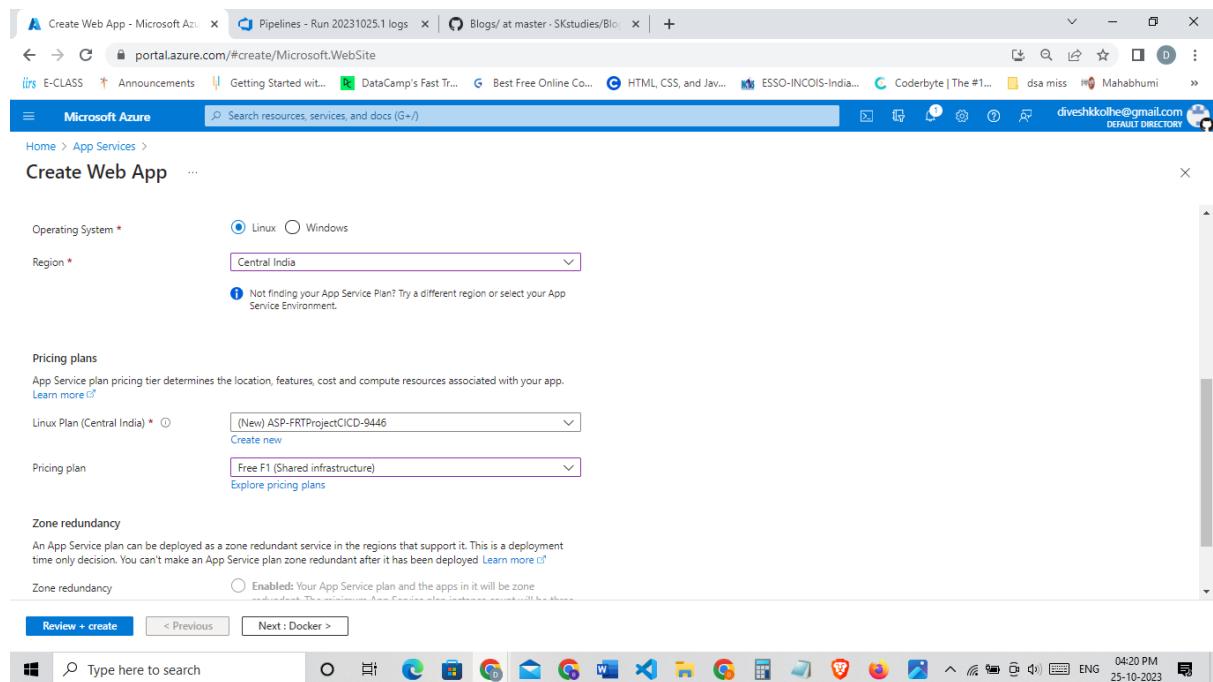
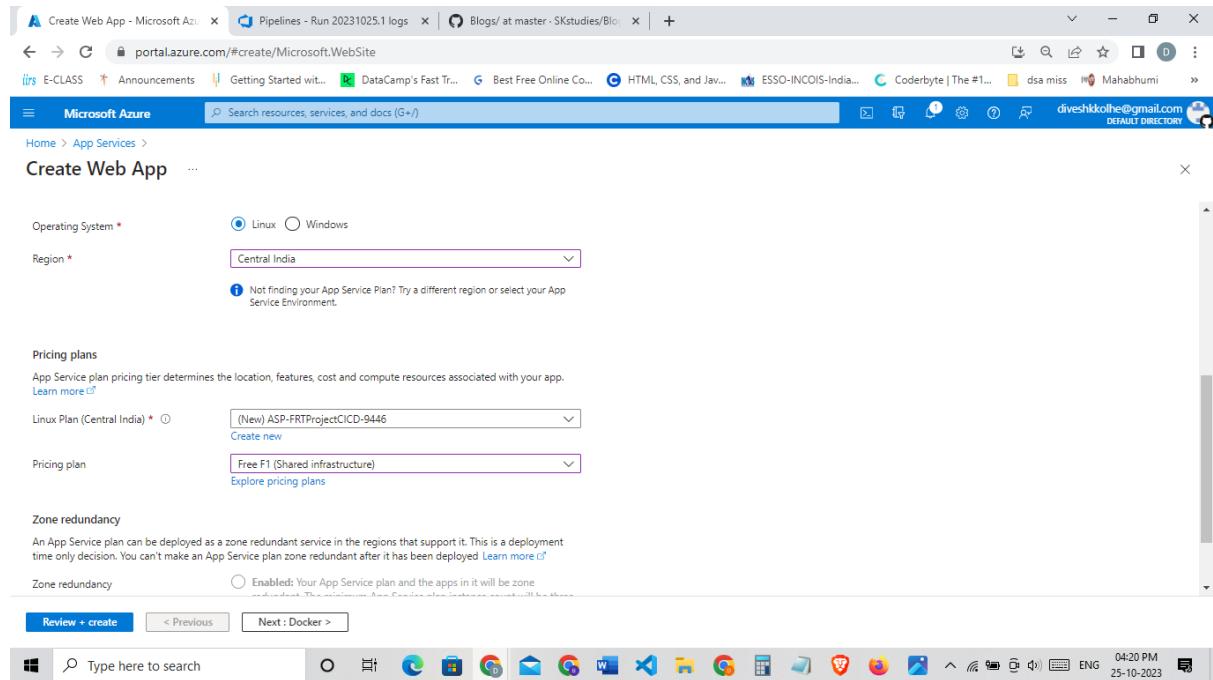
Publish * Docker Container

Operating System * Linux

Region * Central India

Review + create < Previous Next : Docker >

Type here to search



Microsoft Azure

Search resources, services, and docs (G-)

Home > App Services >

Create Web App

Name: BlogAppFRT

Publish: Docker Container

Image/Tag: mcr.microsoft.com/appsvc/staticsite:latest

Server URL: https://mcr.microsoft.com

App Service Plan (New)

Name	ASP-FRTProjectCI/CD-9446
Operating System	Linux
Region	Central India
SKU	Free
ACU	Shared infrastructure
Memory	1 GB memory

Monitoring

Application Insights: Not enabled

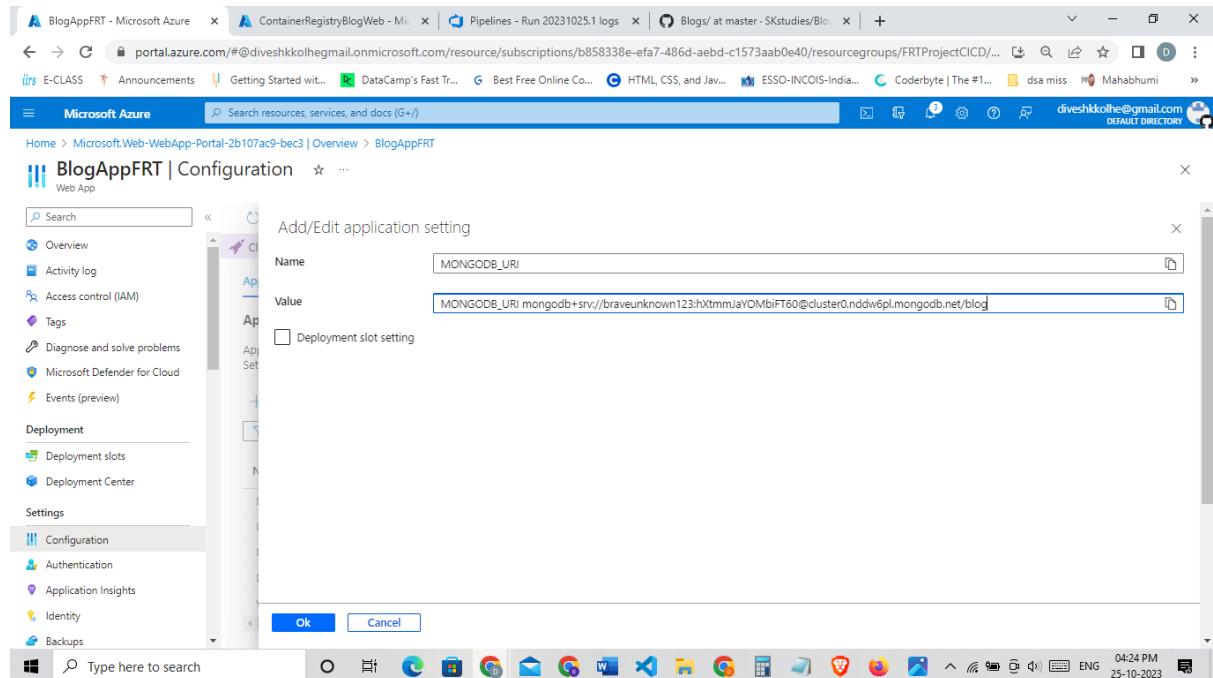
Deployment

Continuous deployment: Not enabled / Set up after app creation

Actions

Create < Previous Next > Download a template for automation

8. Modify Application Settings and Deploy.



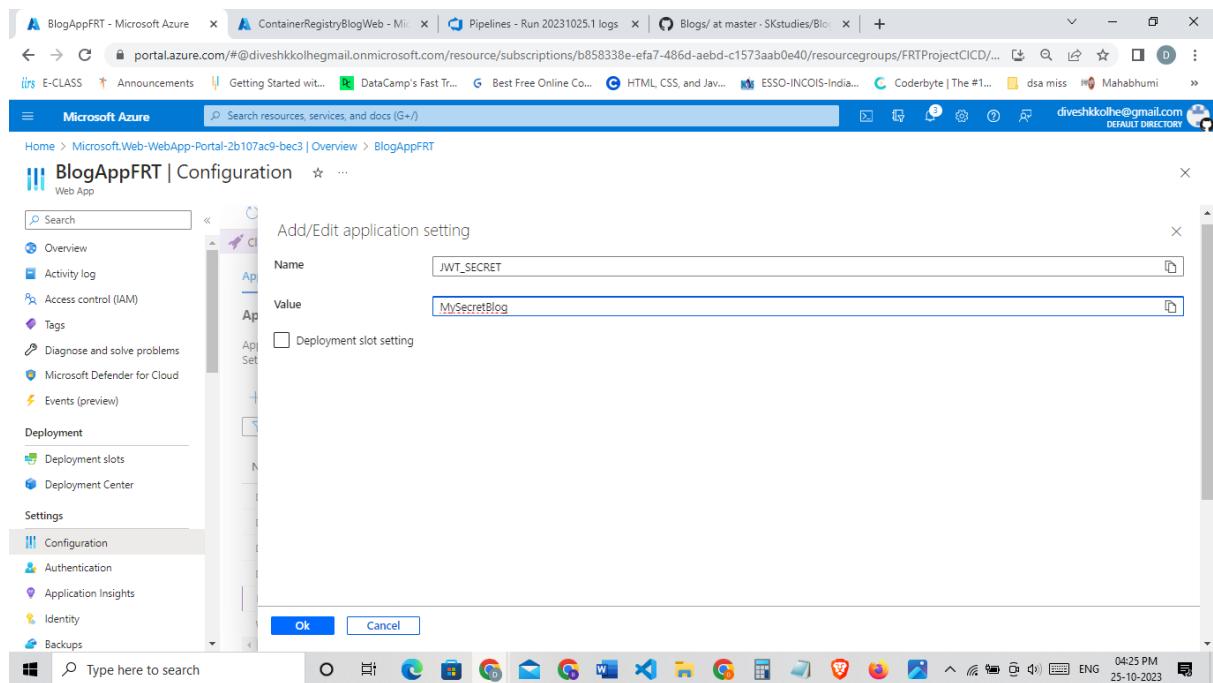
Add/Edit application setting

Name: MONGODB_URI

Value: MONGODB_URI mongodb+srv://braveunknown123:hXtmmJaYOMbiFT60@cluster0.nddw6pl.mongodb.net/blog

Deployment slot setting

ok Cancel



Add/Edit application setting

Name: JWT_SECRET

Value: MySecretBlog

Deployment slot setting

ok Cancel

Screenshot of the Microsoft Azure portal showing the configuration settings for the "BlogAppFRT" web app. The left sidebar shows the "Configuration" section selected. The main pane displays application settings, including environment variables like DOCKER_ENABLE_CI, DOCKER_REGISTRY_SERVER_PASSWORD, DOCKER_REGISTRY_SERVER_URL, DOCKER_REGISTRY_SERVER_USERNAME, JWT_SECRET, MONGODB_URI, and WEBSITES_ENABLE_APP_SERVICE_STORAGE.

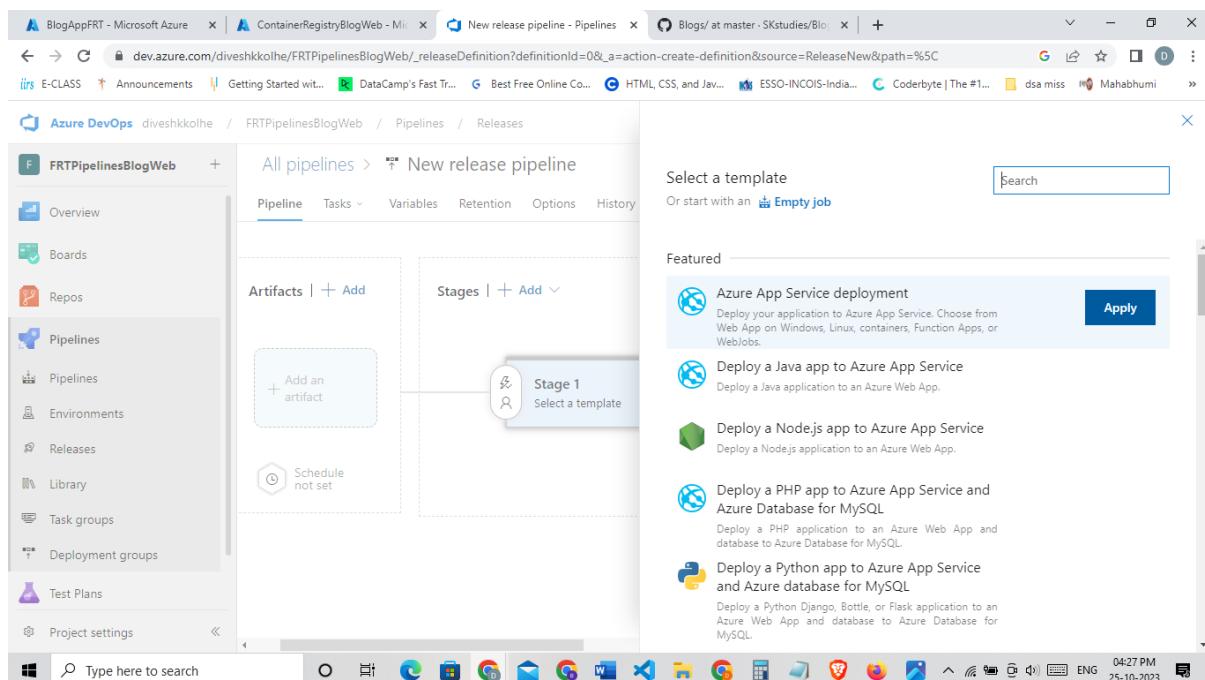
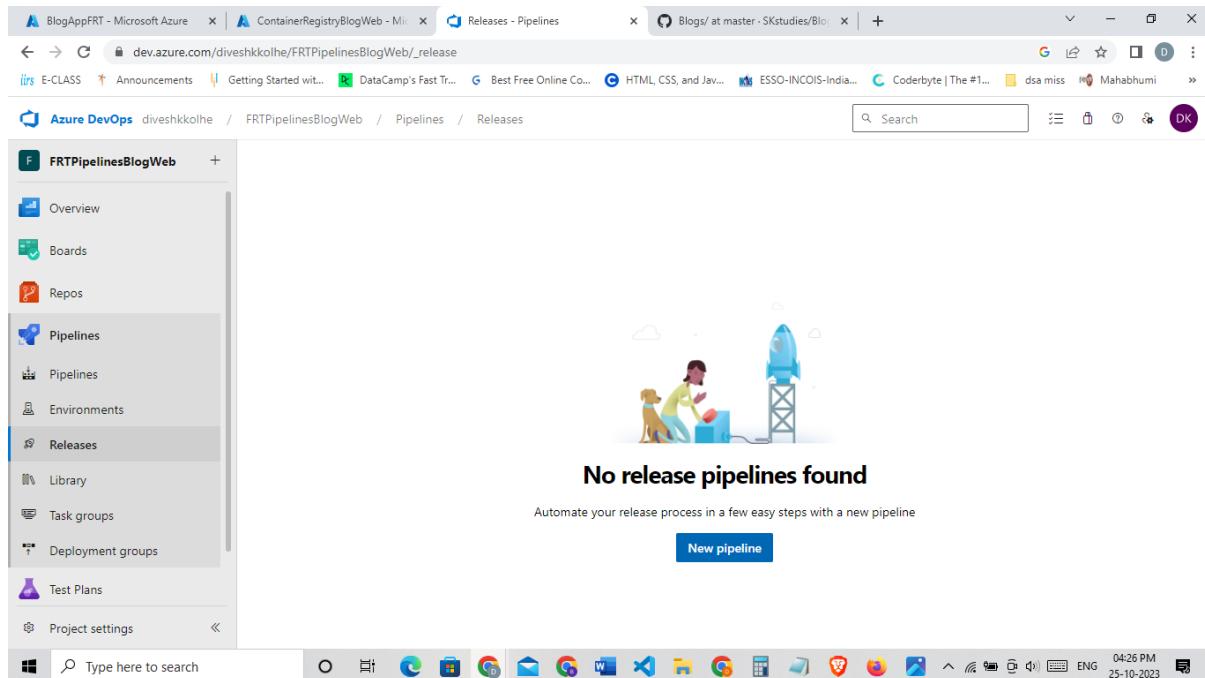
Name	Value	Source	Deployment slot setting	Delete	Edit
DOCKER_ENABLE_CI	Hidden value. Click to show value	App Service			
DOCKER_REGISTRY_SERVER_PASSWORD	Hidden value. Click to show value	App Service			
DOCKER_REGISTRY_SERVER_URL	Hidden value. Click to show value	App Service			
DOCKER_REGISTRY_SERVER_USERNAME	Hidden value. Click to show value	App Service			
JWT_SECRET	Hidden value. Click to show value	App Service			
MONGODB_URI	Hidden value. Click to show value	App Service			
WEBSITES_ENABLE_APP_SERVICE_STORAGE	Hidden value. Click to show value	App Service			

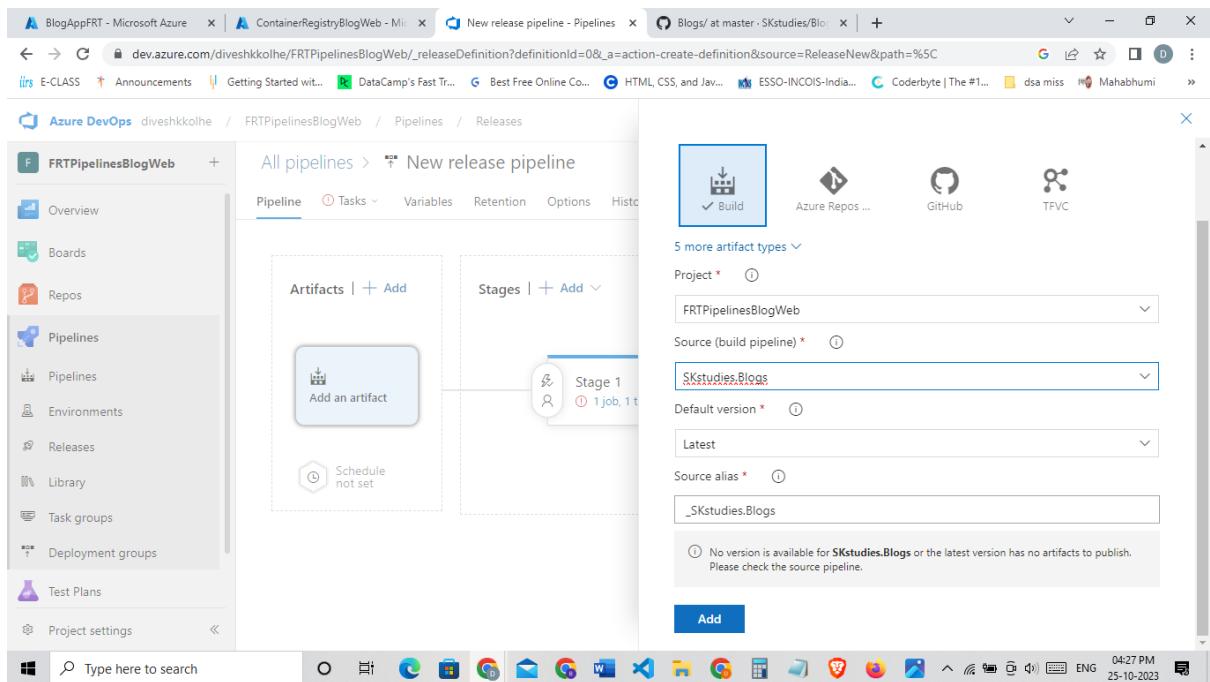
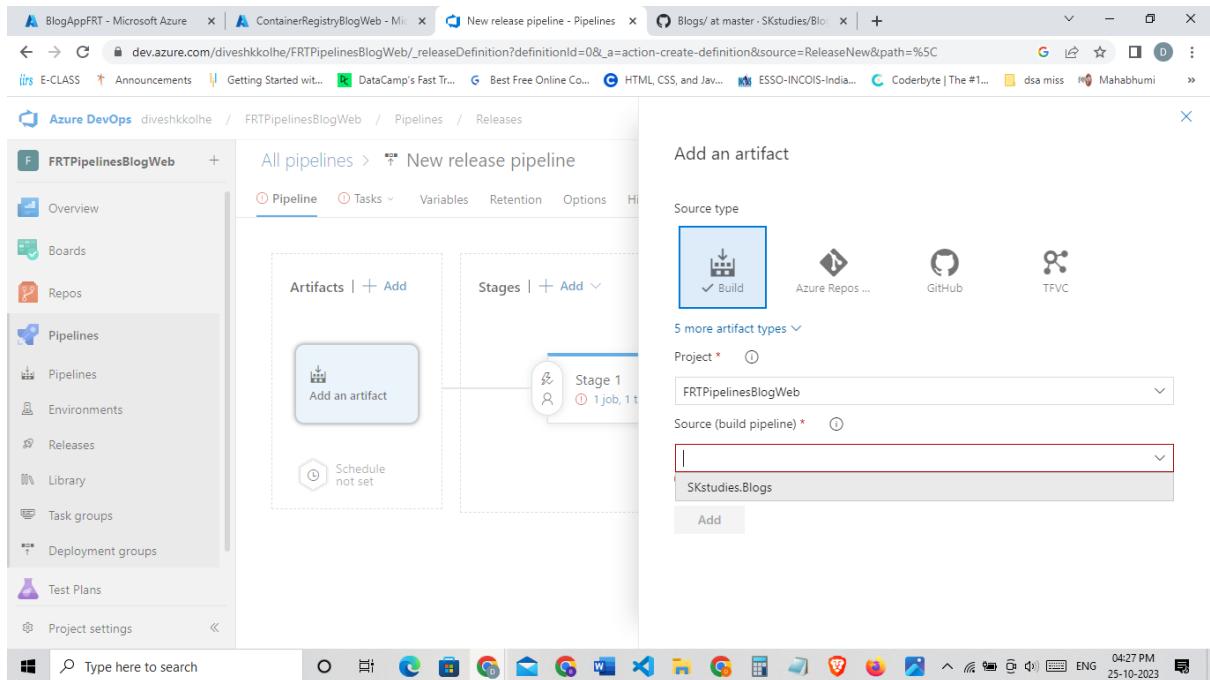
Screenshot of the Microsoft Azure portal showing the deployment center settings for the "BlogAppFRT" web app. The left sidebar shows the "Deployment Center" section selected. The main pane displays deployment settings, including the source (Container Registry), container type (Single Container), registry source (Azure Container Registry), subscription ID (Azure for Students), authentication method (Admin Credentials), and registry name (ContainerRegistryBlogWeb).

The screenshot shows the Azure Deployment Center settings for a Web App named 'BlogAppFRT'. The left sidebar lists various settings like Overview, Activity log, and Deployment slots. The main pane shows the 'Settings' tab selected, with the 'Container Registry' section active. It includes fields for Container type (Single Container), Registry source (Azure Container Registry), Subscription ID (Azure for Students), and Authentication (Admin Credentials). The 'Registry' dropdown is set to 'ContainerRegistryBlogWeb'. The status bar at the bottom indicates it's 04:23 PM on 25-10-2023.

This screenshot shows the same Azure Deployment Center settings page for 'BlogAppFRT', but with more detailed configuration. The 'Image' field is set to 'skstudieblogs' and the 'Tag' field is set to '24'. The 'Continuous deployment' option is turned 'On'. The 'Webhook URL' field contains a placeholder '*****'. The status bar at the bottom indicates it's 04:23 PM on 25-10-2023.

9. Create Release Pipeline.





The screenshot shows the Azure DevOps Pipelines interface for a project named "FRTpipelinesBlogWeb". The left sidebar is visible with options like Overview, Boards, Repos, Pipelines (selected), Environments, Releases, Library, Task groups, Deployment groups, Test Plans, and Project settings. The main area displays a "New release pipeline" configuration. It includes sections for "Artifacts" (containing an artifact named "_SKstudies.Blogs") and "Stages" (containing a single stage labeled "Stage 1"). On the right, there are two trigger configurations: "Continuous deployment trigger" (disabled) and "Pull request trigger" (disabled). A tooltip for the Continuous deployment trigger explains that enabling it will create a new release every time a new build is available. The bottom status bar shows the date and time as 25-10-2023 04:28 PM.

This screenshot shows the same Azure DevOps Pipelines interface as the first one, but with changes made to the triggers. The "Continuous deployment trigger" is now enabled, with a tooltip stating "Creates a release every time a new build is available." The "Pull request trigger" remains disabled. The rest of the pipeline configuration (Artifacts, Stages, and other triggers) appears identical to the first screenshot. The bottom status bar shows the date and time as 25-10-2023 04:28 PM.

Screenshot of the Azure DevOps Pipelines interface showing a new release pipeline.

The pipeline structure is as follows:

```
graph LR; Artifacts["Artifacts | + Add"] --> Stage1["Stage 1 | 1 job, 1 task"]; Stage1 --> ViewTasks["View stage tasks"]
```

Artifacts: _SKstudies.Blogs

Stages: Stage 1 (1 job, 1 task)

Trigger: Continuous deployment trigger

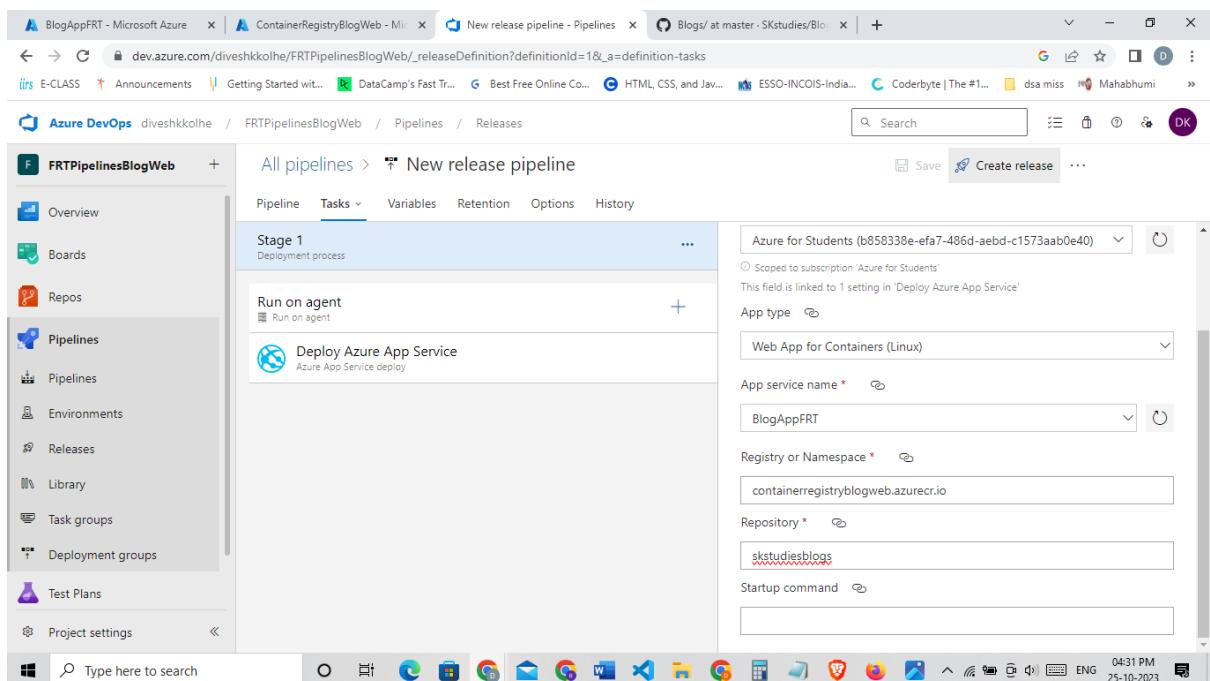
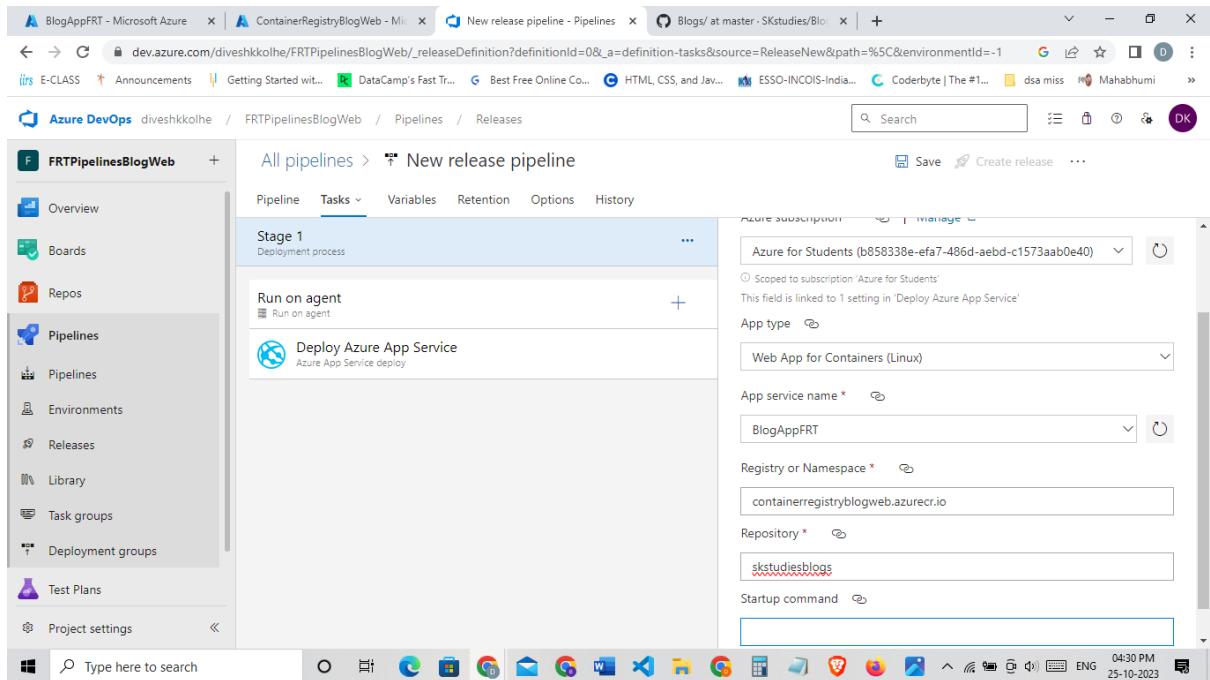
Artifact Source: _SKstudies.Blogs

Stage 1 Task: Deploy Azure App Service

Screenshot of the Azure DevOps Pipelines interface showing the configuration of Stage 1.

Stage 1 Settings:

- Stage name: Stage 1
- Parameters: Azure subscription (selected: Azure for Students (b858330e-ef87-486d-a))
- Authorization: Authorize (button)
- Description: Click Authorize to configure an Azure service connection. A new Azure service principal will be created and added to the Contributor role, having access to all resources in the selected subscription. To restrict the scope of the service principal to a specific resource group, see connect to Microsoft Azure.
- App type: Web App on Windows
- App service name: (redacted)



Screenshot of the Azure DevOps 'Create a new release' pipeline configuration screen.

The pipeline has one stage named 'Stage 1' with the deployment process set to 'Run on agent'. A single task, 'Deploy Azure App Service', is listed under this stage.

Artifacts section: Selects the version for artifact sources. One entry is shown: '_SKstudies.Blogs' with Version '20231025.1'.

Release description: An empty text area.

Buttons at the bottom: 'Create' (highlighted in blue) and 'Cancel'.

Screenshot of the Azure DevOps 'Logs' tab for the 'Stage 1' of the 'Release-1' pipeline.

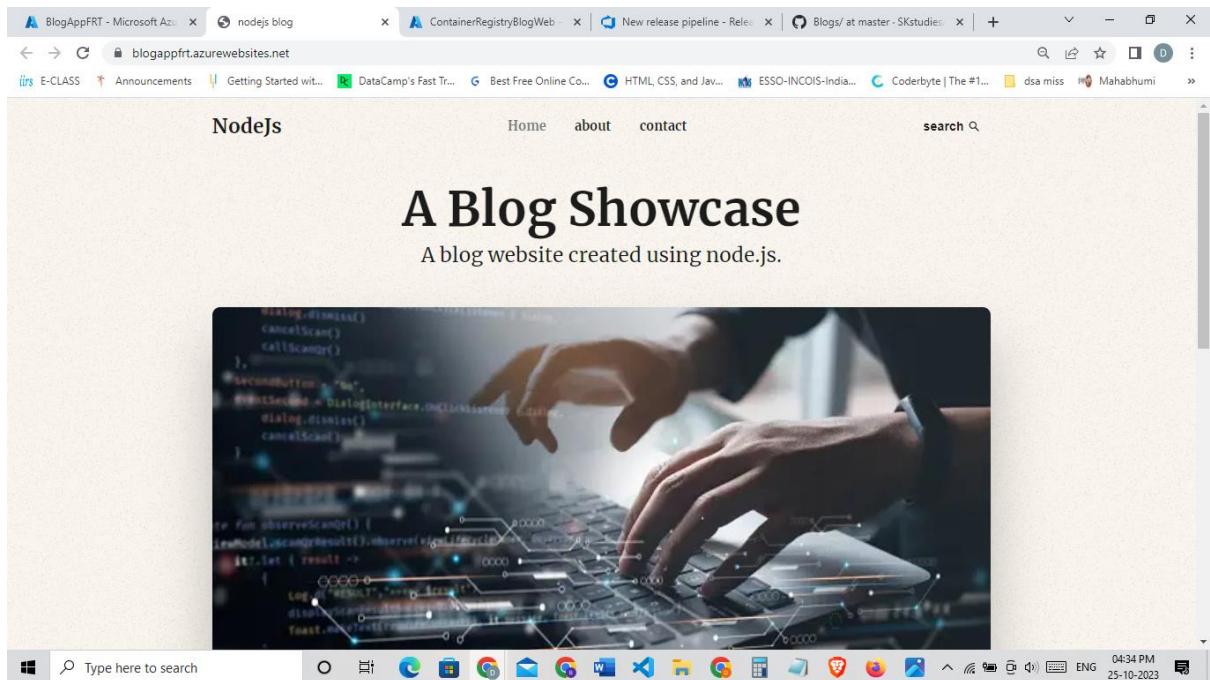
The stage status is 'Succeeded'. The deployment process is also marked as 'Succeeded'.

The 'Run on agent' step is detailed, showing it used a 'Hosted Windows 2019' pool and an 'Agent: Hosted Agent'. It started at 10:25:23 PM on 25-10-2023 and completed in 1m 16s.

The log entries show three tasks:

- Initialize job - succeeded (2s)
- Deploy Azure App Service - succeeded (1m 13s)
- Finalize Job - succeeded (<1s)

10. Search Default Domain Webiste Is Running.



11. Create Custom Domain Scale Up The Plan AS Free Plan Does Not Support Custom Domain.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar has several tabs open, including 'BlogAppFRT - Micros...', 'nodejs blog', 'Container registries', 'New release pipeline', 'Blogs/ at master - SK...', 'Domain Overview | H...', and others. The main title is 'BlogAppFRT | Custom domains'. On the left, a sidebar menu is visible with items like 'Deployment slots', 'Deployment Center', 'Settings', 'Configuration', 'Authentication', 'Application Insights', 'Identity', 'Backups', 'Custom domains' (which is selected and highlighted in blue), 'Certificates', 'Networking', 'Scale up (App Service plan)', 'Scale out (App Service plan)', 'Service Connector', and 'Locks'. Below the sidebar is a search bar and a refresh button. The main content area displays a table for managing custom domains. The table has columns: 'Custom domains', 'Status', 'Solution', 'Binding type', 'Certificate used', and 'Actions'. There is one row shown with the IP address '20.192.170.15' and a verification ID '3F6755CD78FDCE6D46831F18FDD0A0A4EA2DFE5E0D69...'. A 'Filter by keywords' input field and an 'Add filter' button are also present. At the bottom, there is a section titled 'Upgrade to enable custom domains' with a 'Upgrade now' button.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes links for 'BlogAppFRT - Micros...', 'nodejs blog', 'Container registries', 'New release pipeline', 'Blogs/ at master - SK...', 'Domain Overview', and a search bar. Below the navigation is the Microsoft Azure logo and a user profile for 'divehkkolle@gmail.com'.

The main content area displays the 'BlogAppFRT | Custom domains' page for a 'Web App'. On the left, a sidebar lists various management options: Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Events (preview), Deployment (Deployment slots, Deployment Center), Settings (Configuration, Authentication, Application Insights, Identity, Backups), and a search bar.

The central panel shows a table titled 'Custom domains' with one item listed:

Custom domains	Status	Solution	Binding type	Certificate used	Actions
blogappfrt.azurewebsites.net	Secured	-	-	-	Delete

Below the table are buttons for 'Add custom domain' and 'Buy App Service domain'. At the bottom of the page are navigation controls for 'Previous', 'Items per page: 50', 'Page 1 of 1', and 'Next >'. The status bar at the bottom right shows the time as '04:42 PM' and the date as '25-10-2023'.

12. Add A Custom Domain With App Service Managed Certificate.

The screenshot shows the Microsoft Azure portal interface for managing custom domains. On the left, there's a sidebar with navigation links like Home, Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Microsoft Defender for Cloud, Events (preview), Deployment (Deployment slots, Deployment Center), Settings (Configuration, Authentication, Application Insights, Identity, Backups), and a search bar. The main content area is titled 'BlogAppFRT | Custom domains' and shows a table of existing custom domains. On the right, a modal window titled 'Add custom domain' is open, prompting the user to enter a custom domain name ('azurereproject.cloud') and select its type ('A record (example.com)'). It also includes sections for domain provider (set to 'App Service Domain'), TLS/SSL certificate (set to 'App Service Managed Certificate'), and TLS/SSL type (set to 'SNI SSL').

This screenshot shows the same 'Add custom domain' dialog as the previous one, but with different settings. The 'Domain provider' is set to 'All other domain services' instead of 'App Service Domain'. The 'TLS/SSL certificate' is set to 'Add certificate later' instead of 'App Service Managed Certificate'. The 'TLS/SSL type' remains 'SNI SSL'. The rest of the dialog, including the domain name, record type, and validation section, is identical to the first screenshot.

The screenshot shows the Microsoft Azure App Services dashboard for the 'BlogAppFRT' web app. The left sidebar lists various service options like Application Insights, Identity, Backups, Custom domains, Certificates, Networking, Scale up (App Service plan), Scale out (App Service plan), Service Connector, Locks, App Service plan, Quotas, and Development Tools (SSH). The 'Custom domains' section is currently selected. The main pane displays the 'Custom domains' configuration page for 'BlogAppFRT'. It shows an IP address (20.192.170.15) and a Custom Domain Verification ID (3F6755CD78FDCE6D46B31F18FDD0A0A4EA2D1F5EED069...). A table lists two custom domains: 'azureproject.cloud' and 'blogappfrt.azurewebsites.net', both marked as 'Secured' with SNI SSL binding type. Navigation buttons at the bottom include 'Page 1 of 1', 'Items per page: 50', and 'Next >'. The status bar at the bottom right shows the date and time as 30-10-2023 08:55 PM.

The screenshot shows the Hostinger DNS management interface. At the top, there's a navigation bar with links like Home, Hosting, Emails, Domains (which is highlighted in purple), VPS, Billing, and Pro Panel (BETA). Below the navigation is a purple button labeled "Change Nameservers". The main section is titled "Manage DNS records" and contains a sub-section for "CNAME records". It shows a table with one entry:

Type	Name	TXT value	TTL
CNAME	www	azureproject.cloud	300

At the bottom left, there's a "Give feedback" button, and at the bottom right, there's a "Feedback" icon.

hpanel.hostinger.com/domain/azureproject.cloud/dns

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HOSTINGER Home Hosting Emails Domains VPS Billing Pro Panel BETA

Manage DNS records

DNS Record created successfully

Type: A Name: @ Points to: Points to: 14400 Add Record

Search

Type	Name	Priority	Content	TTL	Delete	Edit
TXT	asuid.ww	0	"3F6755CD78FDCE6D46B3F18FDD0AOA4EA2D FE5EED069B2A7F9A2464B57FDC21"	14400	Delete	Edit
CNAME	www	0	blogappfrt.azurewebsites.net	300	Delete	Edit

Give feedback

Type here to search

04:52 PM 25-10-2023

portal.azure.com/#@diveshkkolhegmai.onmicrosoft.com/resource/subscriptions/b858338e-efa7-486d-aebd-c1573aab0e40/resourceGroups/FRTProject...

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Microsoft Azure Search resources, services, and docs (G+)

Home > App Services > BlogAppFRT

App Services Default Directory (diveshkkolhegmai.onmicrosoft.com)

+ Create ...

Filter for any field...

Name

BlogAppFRT

Certificates

BlogAppFRT | Certificates

Web App

Search Refresh Troubleshoot Send your feedback

Managed certificates Bring your own certificates (.pfx) Public key certificates (.cer)

App Service Managed Certificates are free of cost and fully managed by App Service to maintain the safety and security of your site at the highest level. To understand how to create a managed certificate for your app to consume, click on the learn more link. Learn more

Filter by keywords Add filter

1 items

+ Add certificate Delete

Certificate Status	Domain	Certificate Name	Solution
No action needed	azureproject.cloud	azureproject.cloud-BlogAppFRT	-

Page 1 of 1 Items per page: 50 Page 1 of 1 Next < Previous

https://portal.azure.com/#@diveshkkolhegmai.onmicrosoft.com/resource/subscriptions/b858338e-efa7-486d-aebd-c1573aab0e40/resourceGroups/FRTProjectCICD/providers/Microsoft.Web/sites/BlogAppFRT/certificatesReact

Type here to search

09:33 AM 26-10-2023

CICD pipeline in action

13. Commit Changes To github.

The screenshot shows a Microsoft Windows desktop environment. A browser window is open to the GitHub repository 'SKstudies/Blogs'. The 'Commits' tab is selected. The 'master' branch is chosen. The commit history for October 26, 2023, is displayed, showing the following commits:

- Update README.md (SKstudies committed 8 minutes ago) - Verified, hash 5bbad33
- Add README.md (SKstudies committed 12 minutes ago) - hash ccd3126
- Update README.md (SKstudies committed 43 minutes ago) - Verified, hash 779303e
- Merge branch 'master' of https://github.com/SKstudies/Blogs (SKstudies committed 50 minutes ago) - hash e82c51e
- Add README.md (SKstudies committed 51 minutes ago) - hash 586eedb

Below this, a section for 'Commits on Oct 25, 2023' is partially visible. The taskbar at the bottom shows various application icons, and the system tray indicates the date as 26-10-2023 and the time as 10:36 AM.

14. Build Pipeline Triggered

The screenshot shows the Azure DevOps Pipelines interface for the project 'FRTpipelinesBlogWeb'. The 'Pipelines' tab is selected. The table lists the following pipeline runs:

Description	Stages	Time
#20231026.4 • Update README.md Individual CI for master 5bbad335	1 green circle	9m ago 43s
#20231026.3 • Add README.md Individual CI for master ccd31261	1 green circle	12m ago 44s
#20231026.2 • Update README.md Individual CI for master 779303e8	1 green circle	43m ago 54s
#20231026.1 • Merge branch 'master' of https://github.com/S... Individual CI for master e82c51e7	1 green circle	51m ago 51s
#20231025.1 • Set up CI with Azure Pipelines Individual CI for master 2d013821	1 green circle	Yesterday 2m 25s

The left sidebar shows other sections like Overview, Boards, Repos, and Test Plans. The taskbar at the bottom shows various application icons, and the system tray indicates the date as 26-10-2023 and the time as 10:37 AM.

15. Containers Created In ACR.

The screenshot shows the Microsoft Azure portal interface. The left sidebar is collapsed. The main content area displays the 'ContainerRegistryBlogWeb | Repositories' page. On the left, there's a navigation menu with 'Repositories' selected under 'Services'. The central area shows a table of tags for the 'skstudiesblogs' repository. The table has columns for 'Tags', 'Digest', and 'Last modified'. The tags listed are 28, 27, 26, 25, and 24, each with a corresponding digest and timestamp. At the top right, there's a 'JSON View' link. The bottom right corner shows the date and time as 26-10-2023 10:37 AM.

16. Release Pipeline Triggered.

The screenshot shows the Azure DevOps interface. The left sidebar is collapsed. The main content area displays the 'FRTpipelinesBlogWeb' project's 'Releases' screen. The left sidebar has 'Pipelines' selected. The central area shows a list of releases under the 'New release pipeline' section. There are five releases listed: 'Release-5' (Created 10/26/2023, 10:29:03 AM), 'Release-4' (Created 10/26/2023, 10:26:00 AM), 'Release-3' (Created 10/26/2023, 9:55:03 AM), 'Release-2' (Created 10/26/2023, 9:47:32 AM), and 'Release-1' (Created 10/25/2023, 4:31:12 PM). Each release entry includes a 'Stage 1' button. At the top right, there are 'Edit' and 'Create release' buttons. The bottom right corner shows the date and time as 26-10-2023 10:38 AM.

17. Successful Deployment On App Service.

The screenshot shows the Microsoft Azure App Services Deployment Center for the 'BlogAppFRT' web app. The deployment history table lists four successful deployments:

Date	Time	Commit ID	Author	Status	Message
Thursday, October 26, 2023	10:30:56 AM +05:30	5169829	Microsoft.Visu...	Success (Active)	Deployed successfully ↳ Source Version: 5bad33584 ↳ Build: 20231026.4 ↳ Releaser: 5
	10:27:21 AM +05:30	4169829	Microsoft.Visu...	Success	Deployed successfully ↳ Source Version: cd31261ca ↳ Build: 20231026.3 ↳ Releaser: 4
	9:55:57 AM +05:30	3169829	Microsoft.Visu...	Success	Deployed successfully ↳ Source Version: 779303e8c3 ↳ Build: 20231026.2 ↳ Releaser: 3
	9:48:47 AM +05:30	2169829	Microsoft.Visu...	Success	Deployed successfully ↳ Source Version: e82c51e74c ↳ Build: 20231026.1 ↳ Releaser: 2
Wednesday, October 25, 2023	4:32:39 PM +05:30	1169823	Divesh Koihe	Success	Deployed successfully ↳ Source Version: 2d01382169 ↳ Build: 20231025.1 ↳ Releaser: 1

18. Site is Running

The screenshot shows a browser window displaying the 'NodeJs' blog website. The page title is 'A Blog Showcase' and the subtitle is 'A blog website created using node.js.' The background features a hand typing on a keyboard with glowing circuit board graphics overlaying it.

Future Scope:

The future scope of your project can be extended to include additional Azure services such as Cosmos DB, Azure Front Door, and Azure Content Delivery Network (CDN) to further enhance and optimize your web application deployment and delivery. Here's how you can integrate these services:

1. Cosmos DB Integration:

Database Layer Optimization: Integrate Azure Cosmos DB as a globally distributed, highly available, and scalable database solution. This is particularly useful if your web application requires a database for data storage. Cosmos DB can enhance data scalability, redundancy, and global availability.

Microservices Architecture: Implement a microservices architecture and use Cosmos DB to store and manage data for each microservice.

2. Azure Front Door:

Global Load Balancing and Security: Azure Front Door can be employed to improve global load balancing, increase application security, and enhance content delivery to users across the world. It offers features such as WAF (Web Application Firewall), DDoS protection, and SSL offloading.

Application Acceleration: Use Azure Front Door to accelerate the delivery of your web application by routing user requests to the nearest, most responsive backend service.

3. Azure CDN Integration:

Content Distribution: Azure CDN can be used to deliver static content such as images, videos, and large files to users efficiently. It reduces the load on your App Service and improves the user experience by minimizing latency.

Global Scalability: Azure CDN caches content in edge locations around the world, ensuring low latency and high availability for users globally.