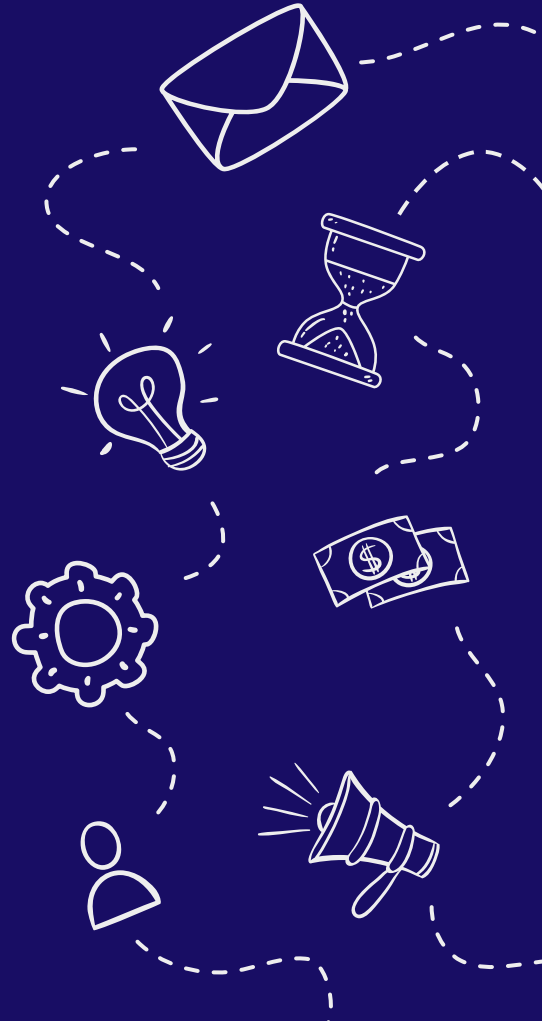


CIE - Github FedRAMP Promotion

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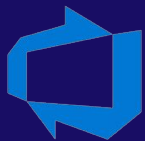


About Project



- CIE Portal provides access to cloud services (Azure) to the partner teams at the project level. It includes mainly cost management, credential management, periodic deletion of the resources, secrets management, etc. As a developer, I need to use Azure DevOps, GitHub Enterprise, etc. to develop the functionalities related cloud and devops and solving some issues that are team specific.
- Features of the portal include CRUD operation for the project, cost management and optimization, Adding and managing repositories, credential management, provisioning logs, functionality to migrate to GitHub (as Azure DevOps will not be providing security updates starting from 2023). The team also provides Azure DevOps Extension for pushing Repositories to Federal Environment, GitHub Actions, etc.

Technology Stack



Azure
DevOps



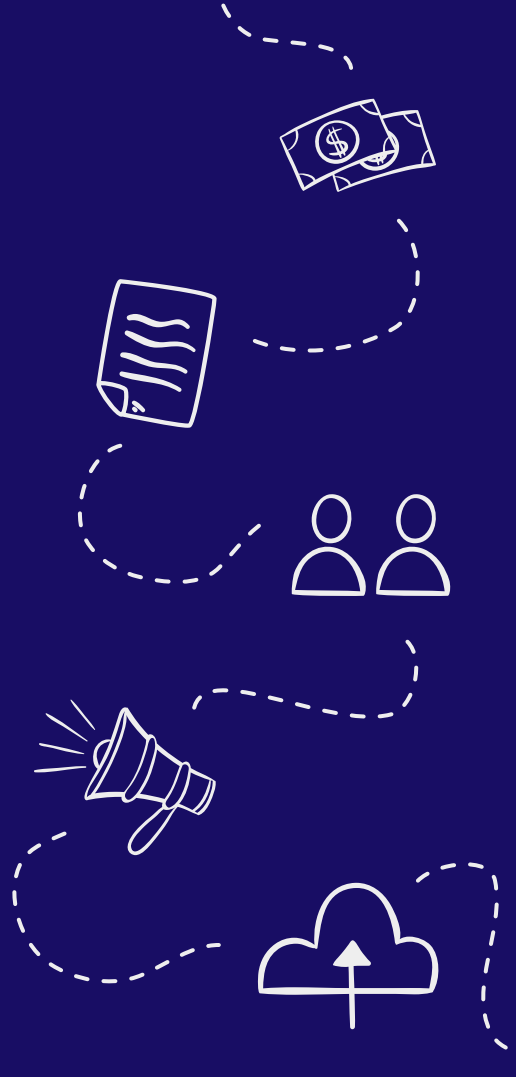
Node.js



GitHub
Actions



GitHub
REST API



Tasks

Pipeline Management Api

- **Pipeline Management API (PMA)** is a service for partner teams using which (only way) they can push their code to Federal Environment.
- For using this service an **Azure Marketplace Extension** is developed which can be added to promotion **pipeline** by the partners to push their code to federal environment.
- It is developed using **Azure DevOps Api** using **Node.js**.
- **Steps:**
 - Validating files and fetching referenced yaml files.
 - Creating repository(if not present) and branch (if not present).
 - Committing files and a Pull Request.
 - Adding reviewers to the pull request.
 - Pushing build logs to kibana.

Tasks

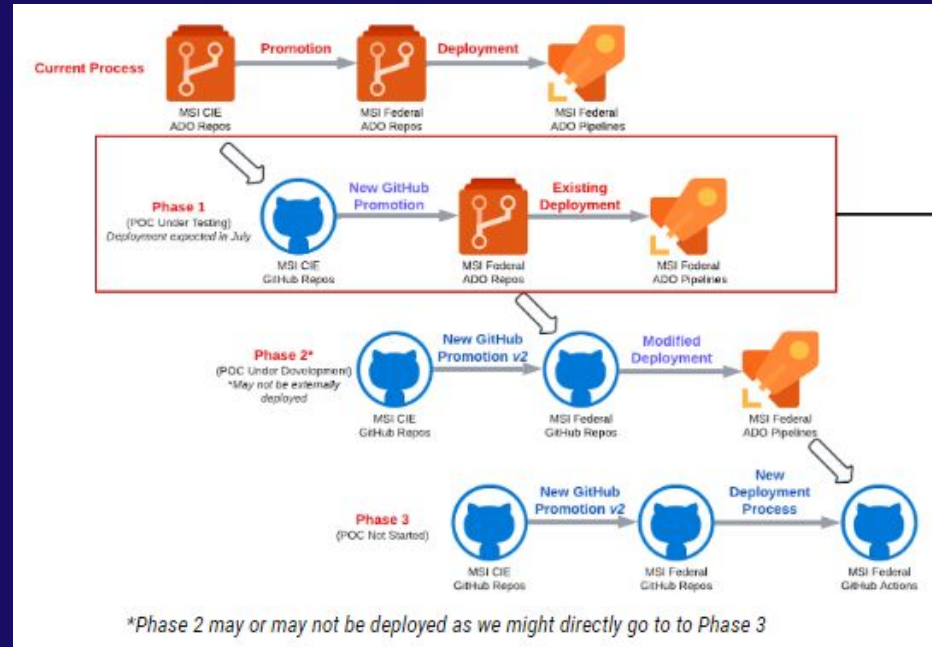
PMA Enhancement

- It only supported adding individual files which can be a tedious task for large projects.
- PMA is the only medium for transferring files so deletion of files is necessary which was not present.
- So **four** enhancements were required:
 - Promotion of **Directories** (recursive)
 - **Deleting** files and directories.
 - If partners don't provide any files for promotion then promotion task goes through the provided yaml files and **recursively** gets all the **referenced** files so partners don't require to add those files individually.
 - Adding support to transfer files another repository but from same organization.

Tasks

GitHub FedRamp Promotion

- Azure DevOps will stop providing security support starting from 2023. So all the repos and pipelines need to be migrated to GitHub Enterprise.
- As a part of it PMA for Github needs to be developed named GitHub Fedramp Promotion. It is planned to be developed in three phases. Phase 2 is deployed and development of **phase 3 is completed** and some enhancements and testing are under process.



Tasks

GitHub FedRamp Promotion

- As a part of migration some teams shifted to Github and some were still using Azure DevOps.
- So first a promotion workflow needs to be developed for promoting files from **GitHub repo to federal** environment which is still on Azure DevOps so deployment will be done using Azure Pipelines.
- For the phase 3 the promotion task will be completely based on GitHub where only GitHub Actions will be used for deployment.
- So all the deployment pipelines should be converted to Github Actions and workflows.
- **Lint** testing were added and currently **Unit** tests are under development.

Tasks

Service Deployment in Github using GitHub Actions

- All the products/services developed by the team needs to be deployed to kubernetes in order to be accessed by other teams.
- As a part of migration a deployment workflows was required to deploy the code after complete migration to GitHub.
- Steps of Deployment:
 - Fetching secrets and environment variables from Azure KeyVault.
 - Building Docker Image and pushing it.
 - Fetching Access Token for Azure Kubernetes Service.
 - Creating and storing secrets on the pods.
 - Deploying the Docker image to Kubernetes.

Thank you



Learning Outcomes

- Understanding a large project and importance of documentation and comments.
- Importance of static code analysis for large scale projects.
- Management of large scale projects using different environments.
- Usage and requirements of Docker and Kubernetes.
- Importance of DevOps and need to automating tasks using pipelines.
- Working of low level Git using commit tree, SHA and blobs.
- Developing features using cloud resources like KeyVault, Kubernetes, etc.