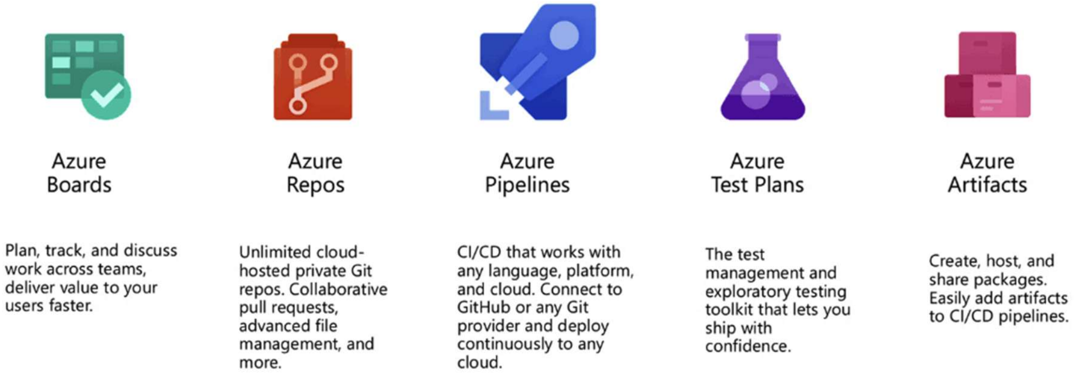
Azure DevOps

Azure DevOps is a comprehensive development platform provided by Microsoft that supports the entire software development lifecycle. It offers a suite of tools that help teams plan, develop, test, deliver, and monitor software projects efficiently and collaboratively. The Azure DevOps portal provides a unified interface to access these tools, making it a powerful solution for DevOps practices.



Azure Boards

Plan, track, and discuss work across teams, deliver value to your users faster.

Azure Repos

Unlimited cloud-hosted private Git repos. Collaborative pull requests, advanced file management, and more.

Azure Pipelines

CI/CD that works with any language, platform, and cloud. Connect to GitHub or any Git provider and deploy continuously to any cloud.

Azure Test Plans

The test management and exploratory testing toolkit that lets you ship with confidence.

Azure Artifacts

Create, host, and share packages. Easily add artifacts to CI/CD pipelines.

Why Azure DevOps?

- **All-in-One Platform:** Combines Boards, Repos, Pipelines, Artifacts, and Test Plans in one place.
- **Language & Platform Agnostic:** Supports .NET, Java, Python, Node.js, and more on Windows, Linux, and macOS.
- **CI/CD Automation**: Enables efficient Continuous Integration and Continuous Deployment.
- **Cloud-Hosted and Scalable**: Managed by Microsoft on Azure; also available on-premises as Azure DevOps Server.
- **Agile Project Management**: Built-in support for Scrum, Kanban, and custom workflows.

- **Traceability**: Full traceability from work items to commits, builds, tests, and deployments.
- **Collaboration Features:** Pull requests, code reviews, dashboards, and work item linking.
- **Extensible Ecosystem:** Integrates with tools like GitHub, Docker, Kubernetes, Jenkins, Slack, and more.
- **Cost-Effective:** Generous free tier; pay-as-you-go pricing that scales with team size.
- **Customizable Workflows:** Supports YAML pipelines, reusable templates, and REST APIs for automation.

1. Azure Boards

Azure Boards is an agile project management tool that helps teams plan, track, and discuss work across the development lifecycle.

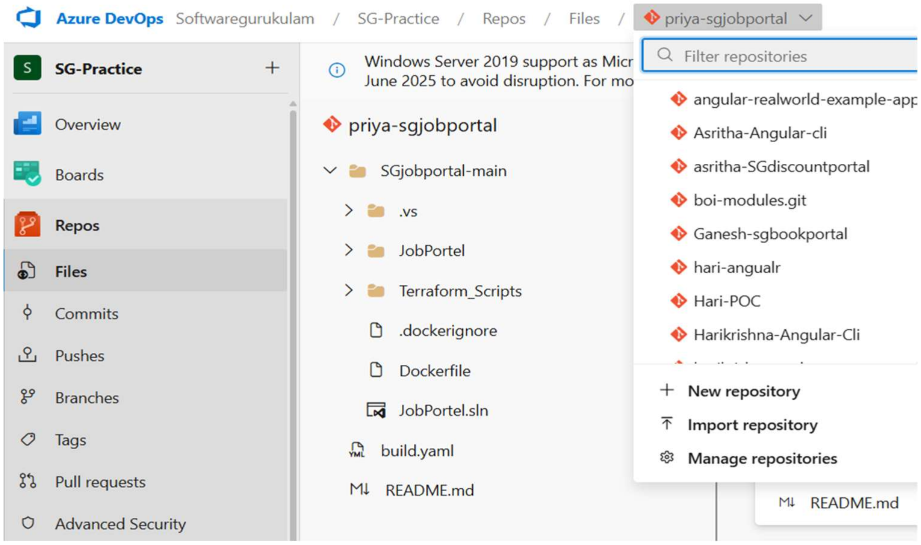
- **Work Items**: Capture tasks, bugs, user stories, and features.
- **Boards, Backlogs, and Sprints**: Visual tools for managing workflows, prioritizing work, and tracking progress.
- Fully customizable workflows and work item types.
- Seamlessly integrates with Azure Repos, Pipelines, and GitHub.

2. Azure Repos

Azure Repos is a set of version control tools that enables software development teams to manage their source code efficiently. It provides cloud-hosted repositories that support collaborative development, code review, and integration with CI/CD pipelines.

Key Features of Azure Repos

- **Unlimited Private Repositories**
  Offers unlimited, secure, cloud-hosted Git repositories for your organization.
- **Branching and Merging**
  Developers can work on feature branches independently and merge changes through pull requests.
- **Pull Requests (PRs)**
  - Facilitate code review, discussion, and approval before changes are merged.
  - Include built-in support for comments, voting, and required policies.
- **Code Search and History**
  Enables fast search across repositories and provides a detailed history of changes for each file.
- **Branch Policies**
  Enforce quality standards using branch protections like:
  - Required code reviews
  - Status checks (builds/tests must pass)
  - Limit who can push directly to protected branches
- **Security and Permissions**
  Granular permission settings allow teams to control access at the repository, branch, and file level.
- **Integration with Azure Pipelines**
  Automatically trigger builds and deployments when code is pushed or pull requests are created.
- **IDE Integration**
  Seamless integration with tools like Visual Studio, VS Code, IntelliJ, and other Git clients.



Windows Server 2019 support as Micr
June 2025 to avoid disruption. For mo

Typical Workflow

1. Clone the repository locally.
2. Create a feature branch.
3. Make and commit code changes.
4. Push changes to Azure Repos.
5. Open a pull request for code review.
6. Review, approve, and merge the changes.
7. Azure Pipelines deploys the updated code.

3. Azure Pipelines

Azure Pipelines is a key component of Azure DevOps that enables teams to implement **Continuous Integration (CI)** and **Continuous Deployment (CD)** for any application, in any language, targeting any platform. It automates the processes of building, testing, and deploying code, ensuring faster and more reliable software delivery.

Key Concepts

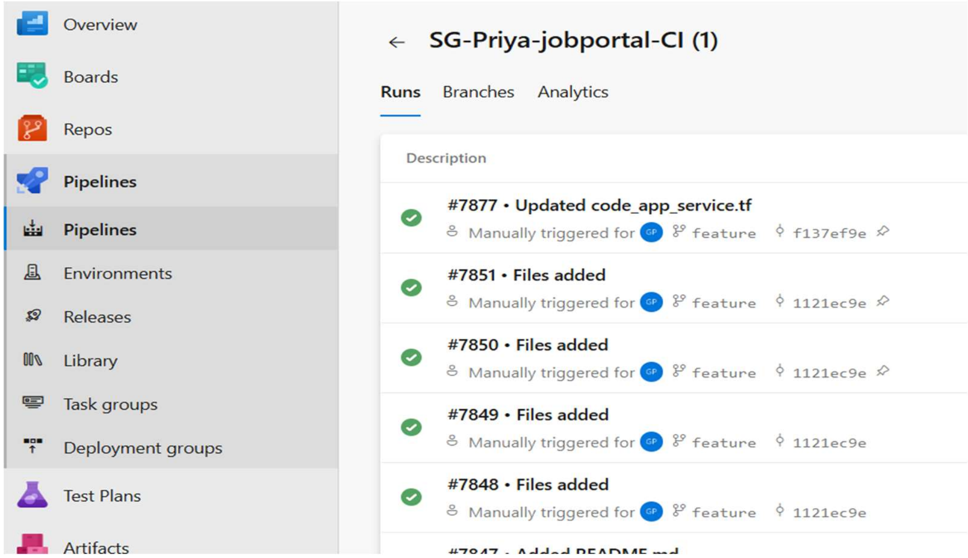
1. **Continuous Integration (CI)**

- Developers frequently push code to a shared repository.
- Each code commit triggers an automated build and test pipeline.
- Early detection of bugs and integration issues.

2. **Continuous Deployment (CD)**
   - Extends CI by automatically deploying code to staging or production after successful builds.
   - Enables rapid delivery of features and fixes to end users.

Pipeline Types

1. **Build Pipelines**
   - Compile code, run tests, and produce build artifacts (e.g., DLLs, binaries, deployment packages).
   - Example: Compile a .NET project and publish the output.
2. **Release Pipelines**
   - Deploy applications across multiple environments (e.g., Dev, QA, Production).
   - Includes stages, tasks, approval gates, and rollback options.



SG-Priya-jobportal-CI (1)

Description

#7877 • Updated code_app_service.tf
Manually triggered for GP feature f137ef9e

#7851 • Files added
Manually triggered for GP feature 1121ec9e

#7850 • Files added
Manually triggered for GP feature 1121ec9e

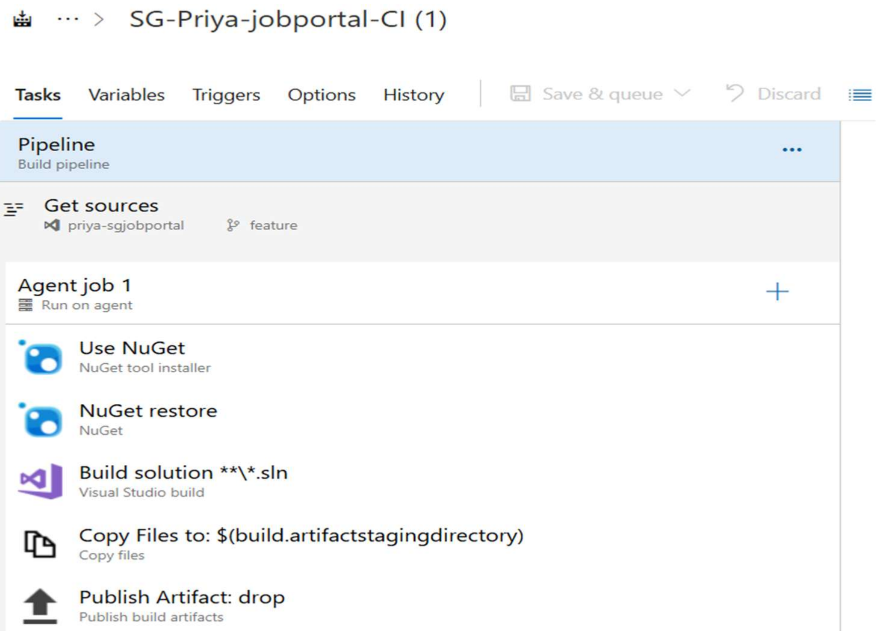
#7849 • Files added
Manually triggered for GP feature 1121ec9e

#7848 • Files added
Manually triggered for GP feature 1121ec9e

#7847 • Added README.md

Pipeline Definition Formats

1. **Classic Editor (GUI-Based)**
   - Visual designer for building pipelines using drag-and-drop tasks.
   - Suitable for beginners or simple workflows.



Pipeline
Build pipeline

Get sources
priya-sgjobportal feature

Agent job 1
Run on agent

Use NuGet
NuGet tool installer

NuGet restore
NuGet

Build solution ***.sln
Visual Studio build

Copy Files to: $(build.artifactstagingdirectory)
Copy files

Publish Artifact: drop
Publish build artifacts

2. **YAML Pipelines (Pipeline as Code)**
    - Written in YAML files stored in the repository.
    - Provides version control, reusability, and easier collaboration.

    YAML script for building and publishing .NET application artifacts:

```
###############
trigger:
- feature
pool:
 vmImage: windows-latest
stages:
- stage: 'Build_Stage'
 jobs:
 - job: 'BuildJob'
  steps:
  - task: NuGetToolInstaller@1
   inputs:
    versionSpec:
   displayName: 'NugetToolInstaller'
  - task: NuGetCommand@2
   inputs:
    command: 'restore'
    restoreSolution: '**/*.sln'
    feedsToUse: 'select'
  - task: MSBuild@1
   inputs:
    solution: '**/*.sln'
    platform: 'any cpu'
    configuration: 'release'
    clean: true
```

```
- task: CopyFiles@2
  inputs:
    SourceFolder: '$(agent.builddirectory)'
    Contents: '**/*.tf'
    TargetFolder: '$(build.artifactstagingdirectory)'
- task: PublishBuildArtifacts@1
  inputs:
    PathtoPublish: '$(Build.ArtifactStagingDirectory)'
    ArtifactName: 'drop'
    publishLocation: 'Container'
```

Pipeline Components

- **Triggers**: Define when a pipeline runs (e.g., on commit, schedule).
- **Agents**: Run the tasks in the pipeline; can be Microsoft-hosted or self-hosted.
- **Stages**: Logical divisions in the pipeline (e.g., Build, Test, Deploy).
- **Jobs**: Groups of steps run sequentially on an agent.
- **Steps/Tasks**: Individual actions like restore, build, test, publish, deploy.
- **Artifacts**: Output from build pipelines used in deployments.
- **Variables**: Used to manage dynamic values across stages and jobs.
- **Deployment groups:** Used to establish a connection between Azure DevOps and Virtual Machine.
- **Service Connection:** Used to establish a connection between Azure DevOps and other cloud services.

Supported Technologies

- Programming languages: .NET, Java, Python, Node.js, Go, PHP, Ruby, etc.
- Platforms: Windows, macOS, Linux.
- Containers: Docker, Kubernetes, Helm.
- Cloud providers: Azure, AWS, GCP (via plugins/extensions).

4. Azure Artifacts

Azure Artifacts provides integrated package management for software dependencies.

- **Package Types**: Supports NuGet, npm, Maven, Python, and Universal Packages.
- **Feeds**: Create and share feeds to manage and distribute packages securely.
- **Retention Policies**: Automatically clean up old or unused packages.
- **Integration**: Works seamlessly with Azure Pipelines to manage build artifacts.