Integrating static analysis tools into the development lifecycle (Defender for DevOps)

In this lab, you will configure Defender for DevOps. Microsoft Security DevOps is a command line application that integrates static analysis tools into the development lifecycle. Microsoft Security DevOps installs, configures, and runs the latest versions of static analysis tools (including, but not limited to, SDL/security and compliance tools).

The Microsoft Security DevOps uses the following Open Source tools: Bandit, BinSkim, ESlint, Credscan, Template Analyzer, Terrascan and Trivy.

Objectives

After completing this lab, you will be able to:

- SAST scan using Bandit locally.
- Configure the Microsoft Security DevOps Azure DevOps extension.
- Configure the Microsoft Security DevOps GitHub actions
- DevOps Security Workbook

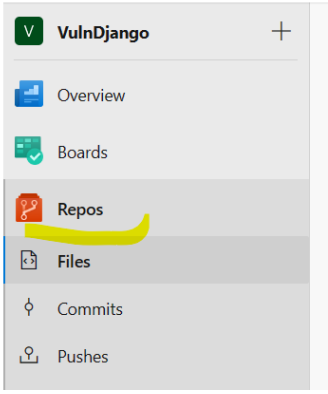
Estimated Time: 2 Hour

Lab Environment

- Azure DevOps
- GitHub Actions

Exercise 1: Import the vulnerable code

1. On GitHub, fork the vulnerable code from S2FrdQ/VulnDjango (github.com)
2. On Azure DevOps, create a new Private project and name it VulnDjango. Navigate to Repos, and import the vulnerable code from https://github.com/S2FrdQ/VulnDjango.git



Exercise 2: SAST scan using Bandit locally.

Bandit - The Bandit is a tool designed to find common security issues in Python code. To do this Bandit, processes each file, builds an AST, and runs appropriate plugins against the AST nodes. Once Bandit has finished scanning all the files it generates a report. Bandit was originally developed within the OpenStack Security Project and later rehomed to PyCQA.

i. Download the source code locally – `git clone https://github.com/S2FrdO/VulnDjango webappdjango` then `cd webappdjango`

ii. Install Bandit `pip3 install bandit`

iii. If a warning is issued to add Directory to path, add using the below command.

```
export PATH="/home/kali/.local/bin:$PATH"
```

To explore bandit --help

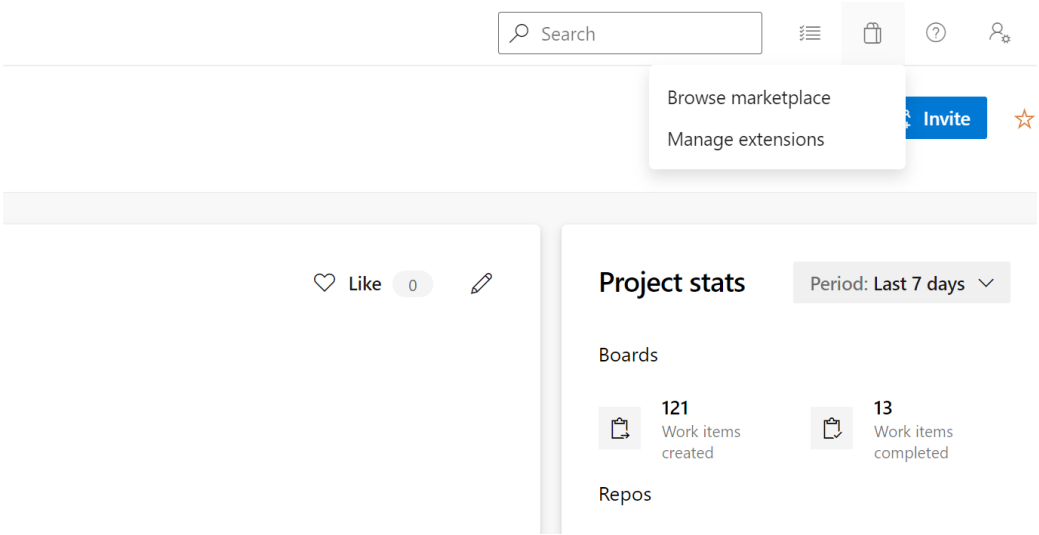
iv. Run the scanner - We are using the **tee** command here to show the output and store it in a file simultaneously. `bandit -r .` Basic scan

```
bandit -r . -f json | tee bandit-output.json
```

Exercise 3: Configure the Microsoft Security DevOps Azure DevOps extension.

Note: Admin privileges to the Azure DevOps organization are required to install the extension.

1. Activate Microsoft Security DevOps extension – on your Azure DevOps portal with the **VulnDjango** project open, click on the marketplace icon > **Browse Marketplace**.



2. On the Marketplace, search for **Microsoft Security DevOps** and open it.

3. On the **Microsoft Security DevOps** page, click on **Get it for free**.

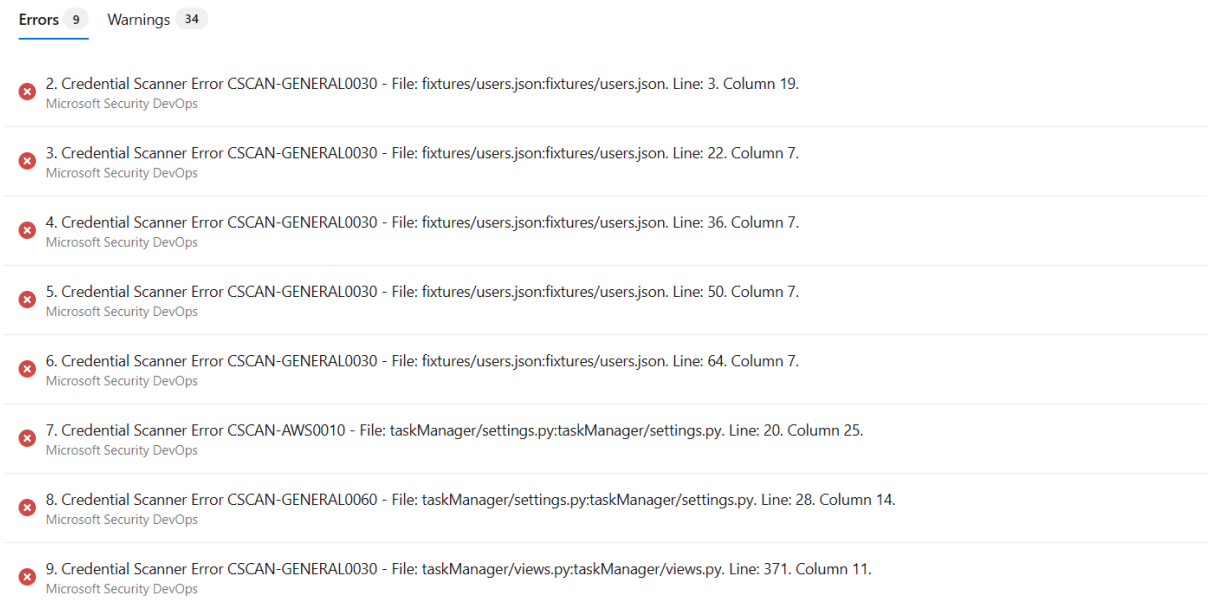
4. On the next page, select the desired Azure DevOps organization and Install. Proceed to organization once installed.
5. Navigate to your VulnDjango project, then Pipelines and Click New pipeline.

6. On the Where is your code? window, select Azure Repos Git (YAML) and select the VulnDjango repository.
7. On Add the following scripts as in into the yaml file.

```
# Starter pipeline
# Start with a minimal pipeline that you can customize to build and deploy your code.
# Add steps that build, run tests, deploy, and more:
# https://aka.ms/yaml
trigger: none
pool:
  vmImage: 'windows-latest'
steps:
- task: UseDotNet@2
  displayName: 'Use dotnet'
  inputs:
    version: 3.1.x
- task: UseDotNet@2
  displayName: 'Use dotnet'
  inputs:
    version: 5.0.x
- task: UseDotNet@2
  displayName: 'Use dotnet'
  inputs:
    version: 6.0.x
- task: MicrosoftSecurityDevOps@1
  displayName: 'Microsoft Security DevOps'
```

8. Click Save and run and let the pipeline run. You can check progress by going to Pipeline-Pipelines and select the running pipeline.
9. When done, you can view security vulnerabilities found by **Microsoft Security DevOps** , by clicking Scans.

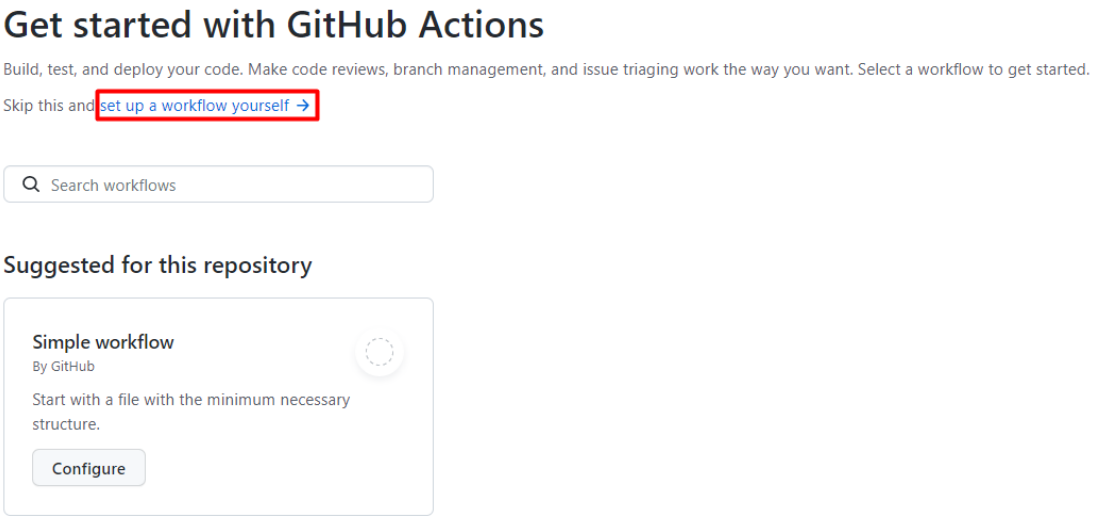
Note: Install the SARIF SAST Scans Tab extension on the Azure DevOps organization in order to ensure that the generated analysis results will be displayed automatically under the Scans tab.



https://learn.microsoft.com/en-us/azure/defender-for-cloud/azure-devops-extension

Exercise 4: Configure the Microsoft Security DevOps GitHub actions

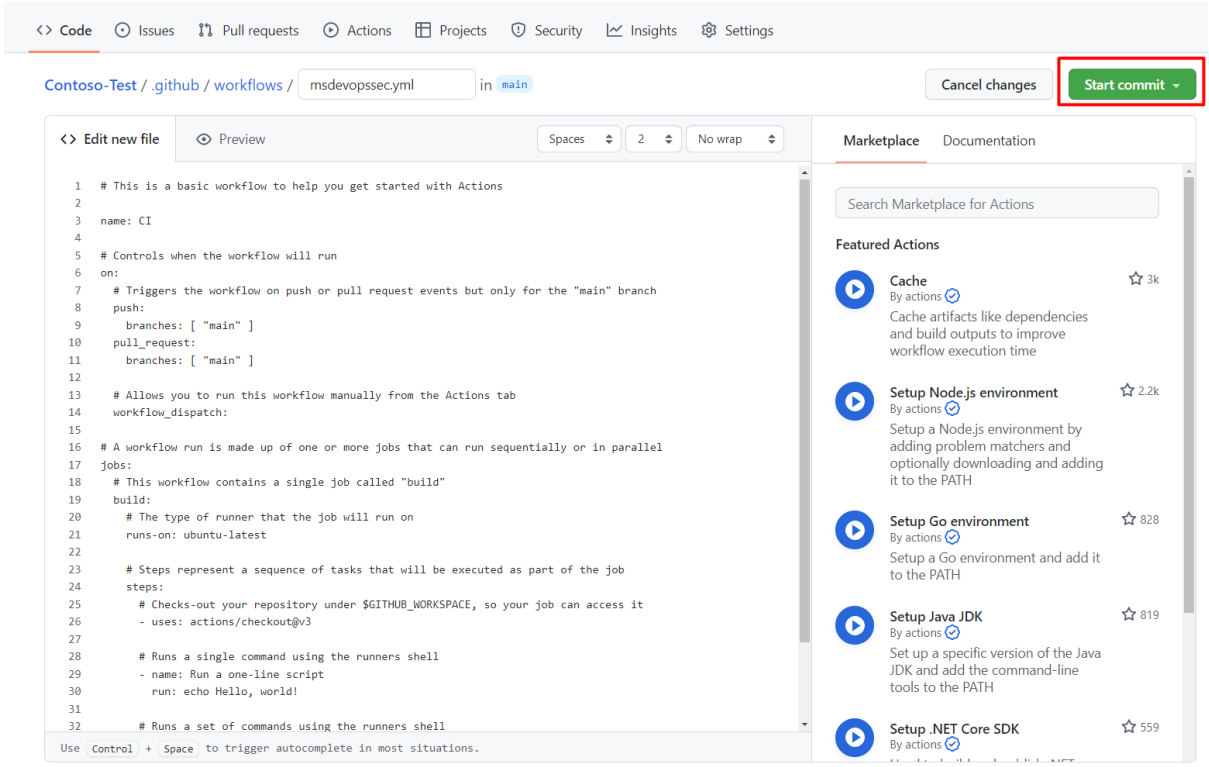
1. Navigate to your VulnDjango GitHub repo.
2. Select Actions
3. Select **New workflow**.
4. On the Get started with GitHub Actions page, select **set up a workflow yourself**



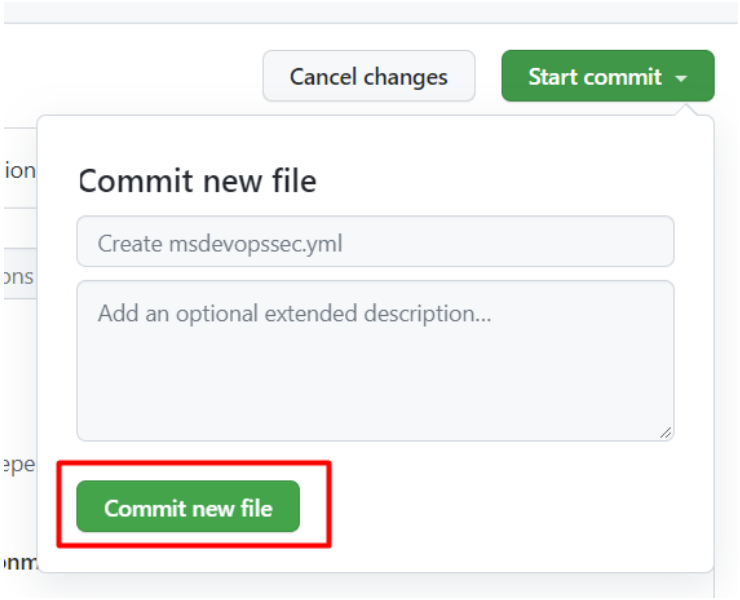
5. In the text box, enter a name for your workflow file. For example, msdevopssec.yml.
6. Copy and paste the following sample action workflow into the Edit new file tab.

```yaml
name: MSDO windows-latest
    on:
      push:
        branches: [ main ]
      pull_request:
        branches: [ main ]
      workflow_dispatch:

    jobs:
      sample:

        # MSDO runs on windows-latest and ubuntu-latest.
        # macos-latest supporting coming soon
        runs-on: windows-latest

        steps:
        - uses: actions/checkout@v3

        - uses: actions/setup-dotnet@v3
          with:
            dotnet-version: |
              5.0.x
              6.0.x

        # Run analyzers
        - name: Run Microsoft Security DevOps Analysis
          uses: microsoft/security-devops-action@preview
          id: msdo

        # Upload alerts to the Security tab
        - name: Upload alerts to Security tab
          uses: github/codeql-action/upload-sarif@v2
          with:
            sarif_file: ${{ steps.msdo.outputs.sarifFile }}
```

7. For details on various input options, see action.yml
8. Select **Start commit**

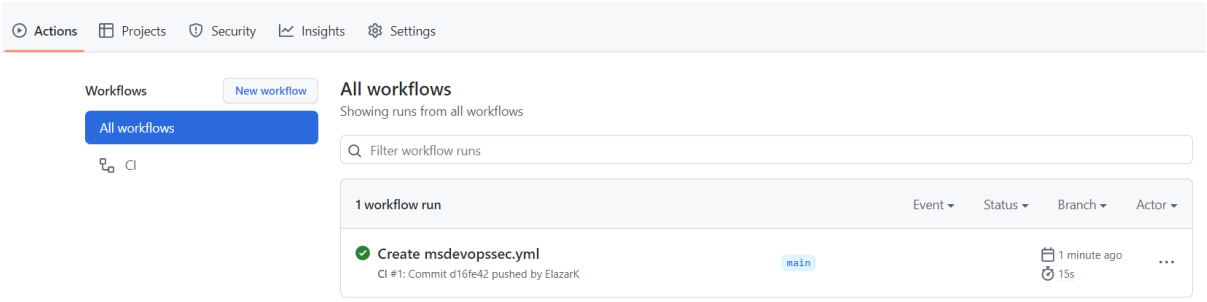


9. Select **Commit new file**.



The process can take up to one minute to complete.

10. Select **Actions** and verify the new action is running.



View Scan Results

To view your scan results:

Navigate to **Security** > **Code scanning alerts** > **Tool**.

From the dropdown menu, select **Filter by tool**.

Code scanning findings will be filtered by specific MSDO tools in GitHub. These code scanning results are also pulled into Defender for Cloud recommendations.

[Configure the Microsoft Security DevOps GitHub action | Microsoft Learn]

Exercise 5: DevOps Security Workbook

Navigate to Defender for Cloud, click on Workbooks, then click on **DevOps Security (Preview)** to launch the Workbook.

[DevOps Security Workbook - Microsoft Community Hub]