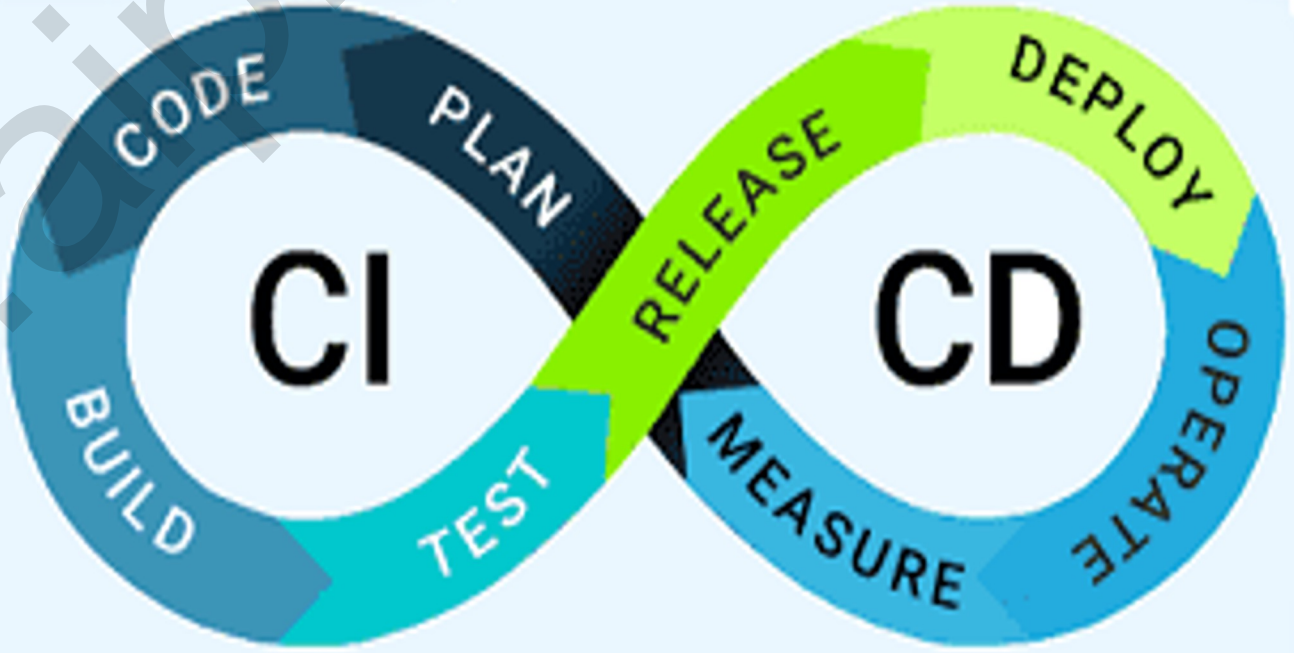
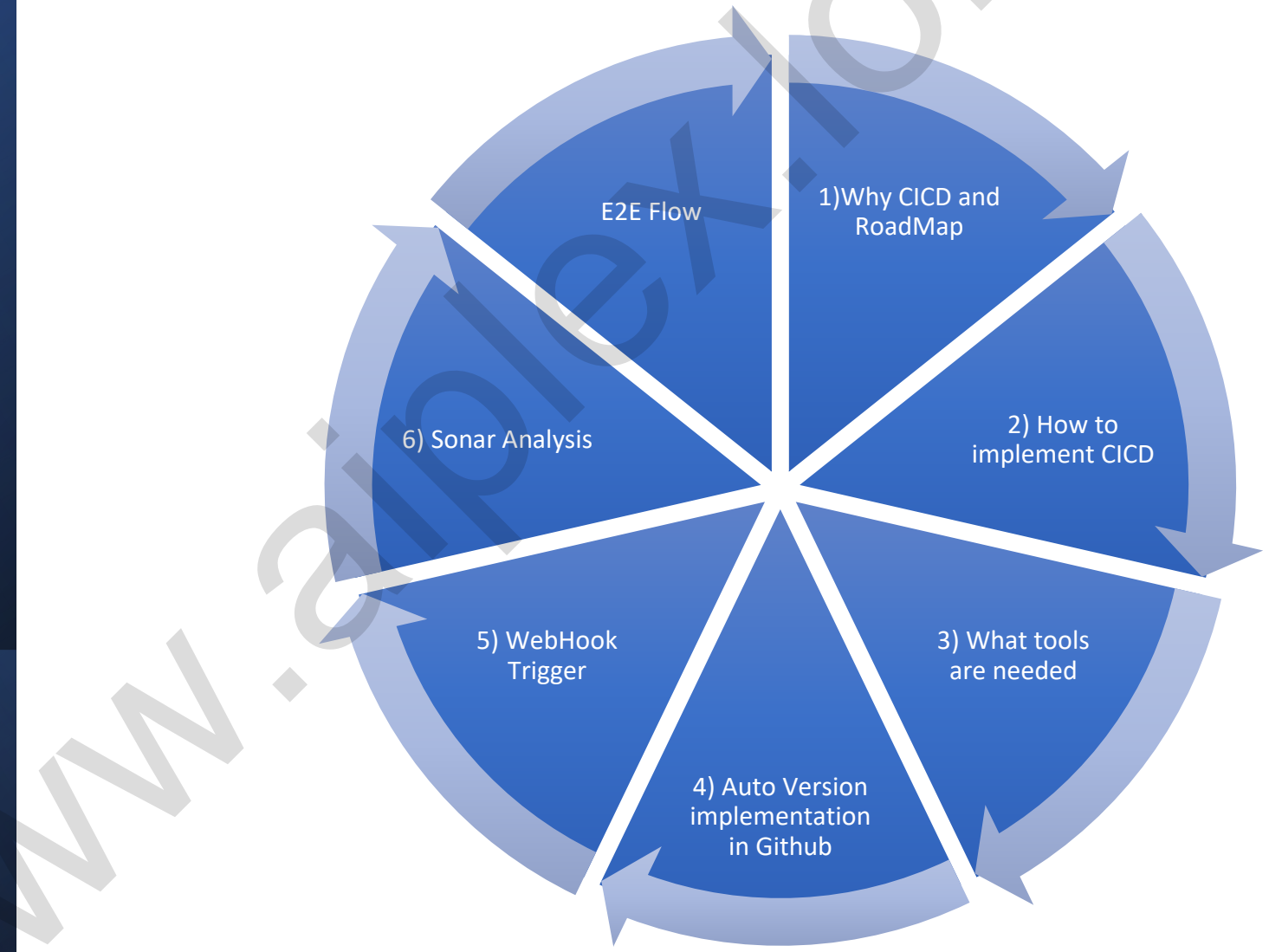
CICD End To End Flow

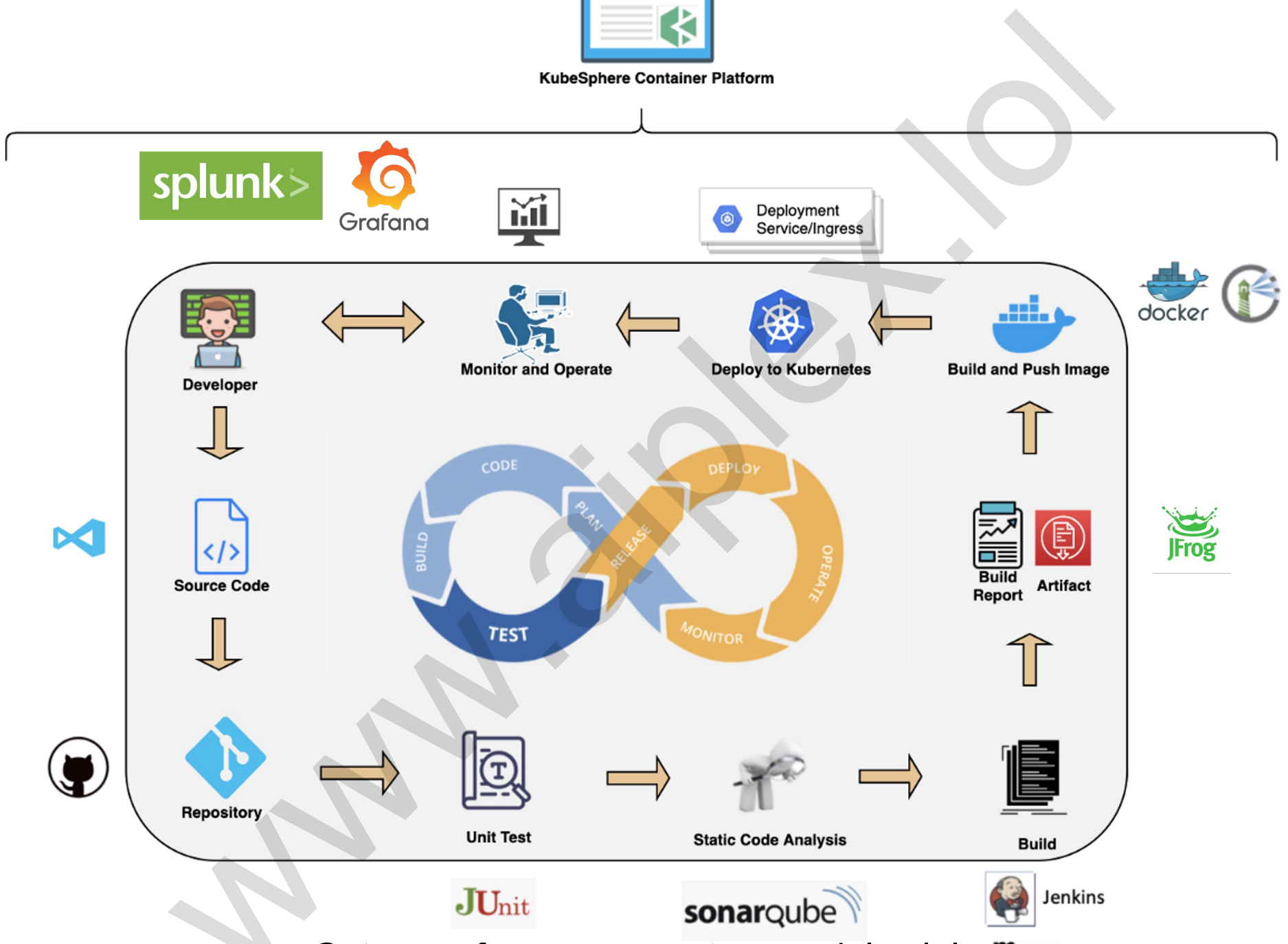
DevOps - CI/CD



By Praveen Singampalli

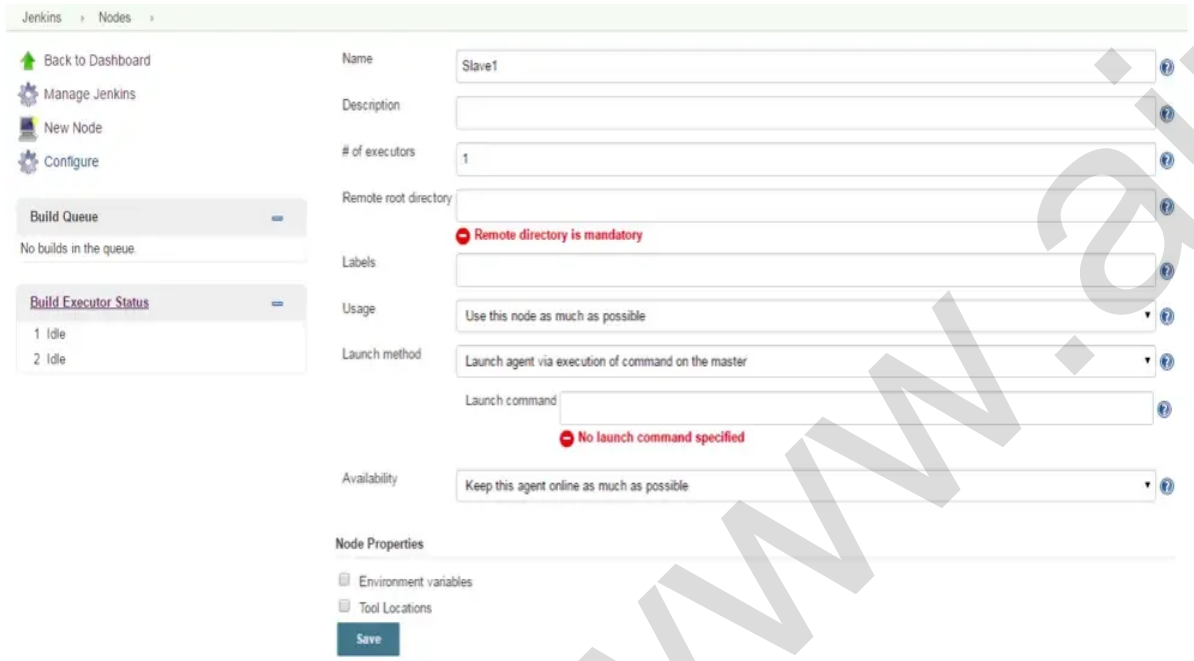
CICD discussion:

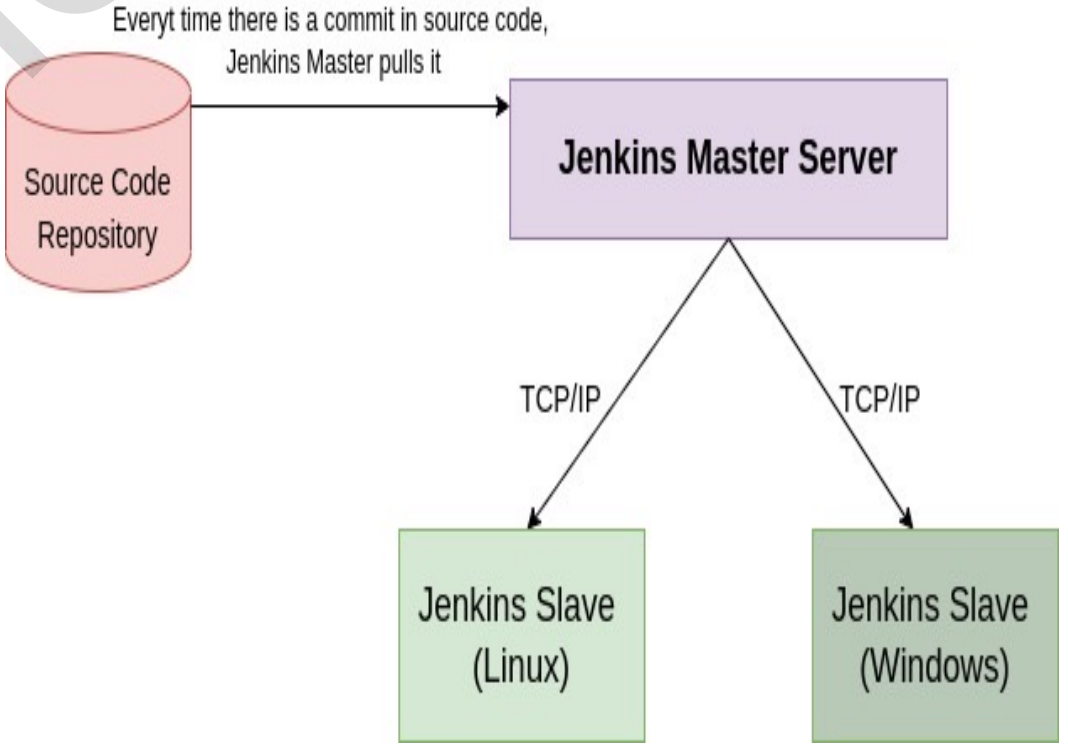




Master Slave Setup

- Reduce the load on system
- Have different systems tied up for different code pipelines
- Failover Mechanism

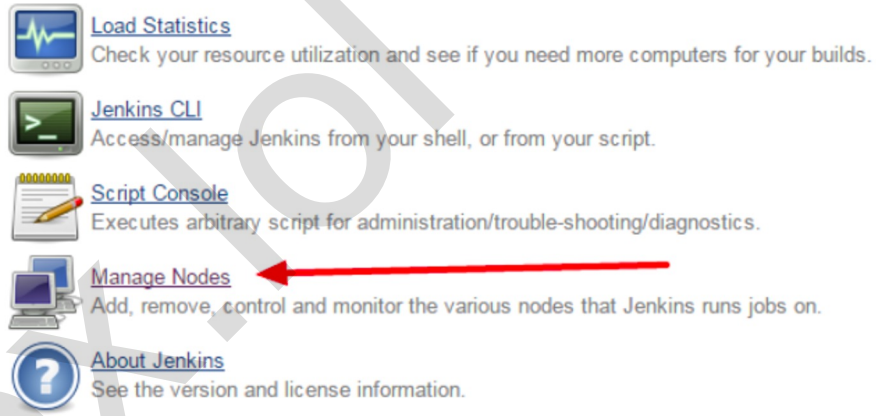




Jenkins Master slave Setup Steps

1

2



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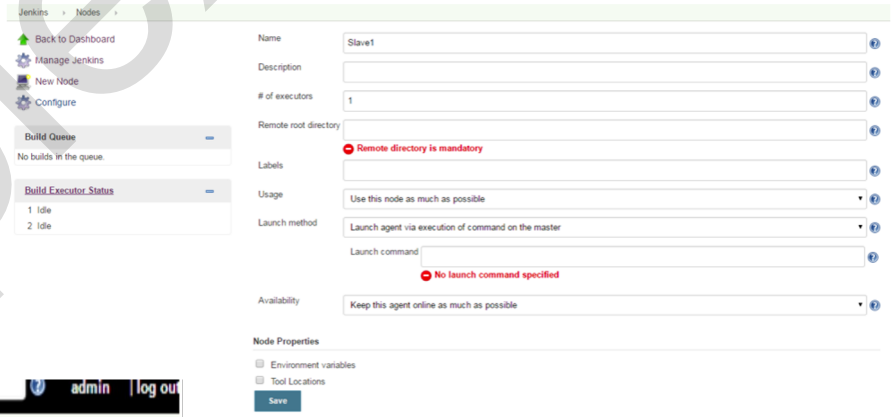

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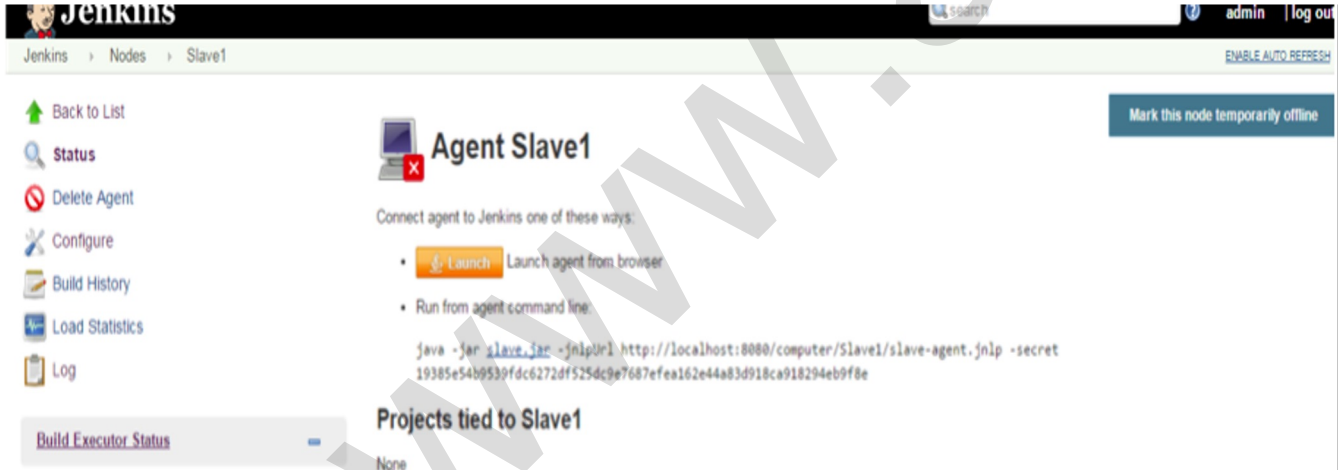


Different types of Jenkins Pipeline

- ***Declarative Pipeline Syntax***

The declarative syntax is a new feature that uses code for the pipeline. It provides a limited pre-defined structure. Thereby, it offers an easy & simple continuous delivery pipeline. Moreover, it uses a *pipeline block*.

- ***Scripted Pipeline Syntax***

Unlike declarative syntax, the *scripted pipeline syntax* is the old traditional way to write the *Jenkinsfile* on Jenkins web UI. Moreover, it strictly follows the groovy syntax and helps to develop a complex pipeline as code.

```
pipeline {
        agent any
        stages {
                stage('One') {
                steps {
                    echo 'Hi, welcome to pipeline demo...'
                }
                }
                stage('Two') {
                steps {
                   echo('Sample testing of Stage 2')
                }
                }
                stage('Three') {

                steps {
                      echo 'Thanks for using Jenkins Pipeline'
                }
                }
            }
}
```

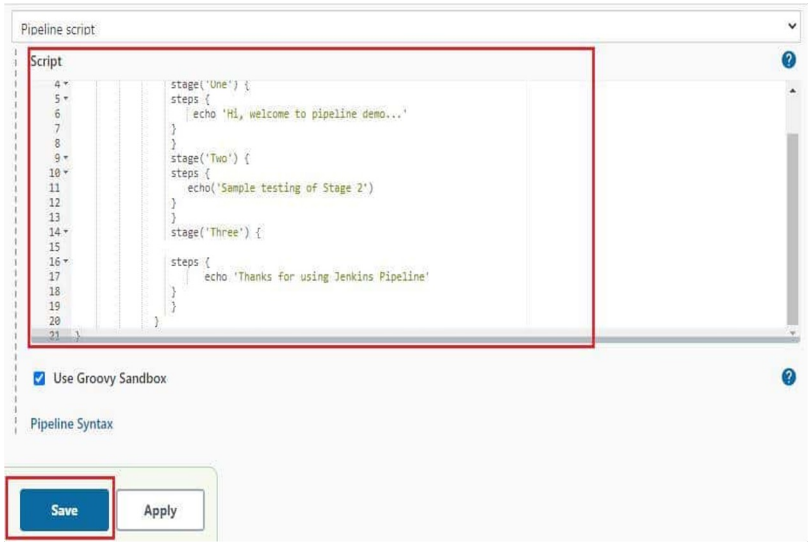
Declarative Pipeline

```
pipeline {
  agent {
    // executes on an executor with the label 'some-label' or 'docker'
    label "some-label || docker"
  }

  stages {
    stage("foo") {
      steps {
        // variable assignment (other than environment variables) can only
        // complex global variables (with properties or methods) can only
        // env variables can also be set within a script block
        script {
          foo = docker.image('ubuntu')
          env.bar = "${foo.imageName()}"
          echo "foo: ${foo.imageName()}"
        }
      }
    }
    stage("bar") {
      steps{
        echo "bar: ${env.bar}"
        echo "foo: ${foo.imageName()}"
      }
    }
  }
}
```

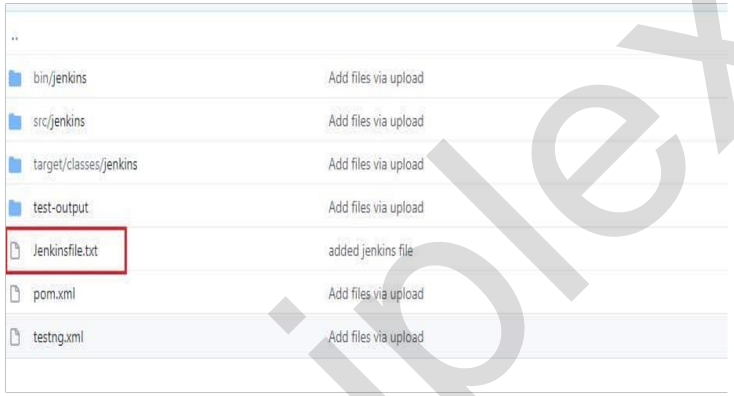
Scripted Pipeline

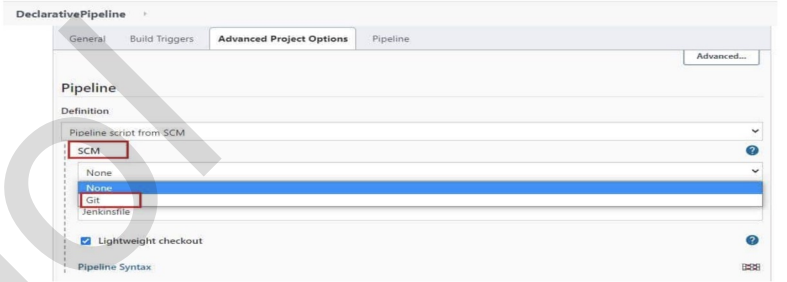
```
node {

  git url: 'https://github.com/jfrogdev/project-examples.git'

  // Get Artifactory server instance, defined in the Artifactory Plugi
  def server = Artifactory.server "SERVER_ID"

  // Read the upload spec and upload files to Artifactory.
  def downloadSpec =
      '''{
      "files": [
        {
            "pattern": "libs-snapshot-local/*.zip",
            "target": "dependencies/",
            "props": "p1=v1;p2=v2"
        }
      ]
   }'''

  def buildInfo1 = server.download spec: downloadSpec

  // Read the upload spec which was downloaded from github.
  def uploadSpec =
     '''{
     "files": [
       {
          "pattern": "resources/Kermit.*",
          "target": "libs-snapshot-local",
          "props": "p1=v1;p2=v2"
       },
       {
          "pattern": "resources/Frogger.*",
          "target": "libs-snapshot-local"
       }
      ]
    }'''
```

Scripted Pipeline

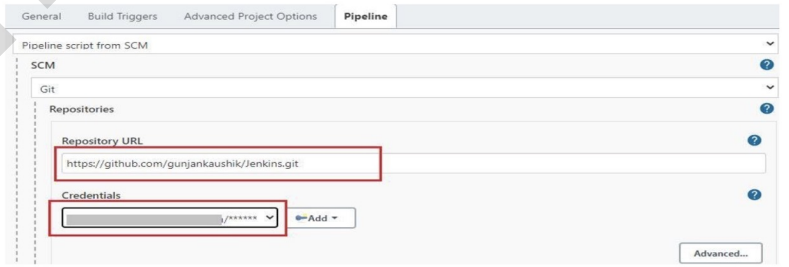


Declarative Pipeline(Jenkinsfile add to git repo)

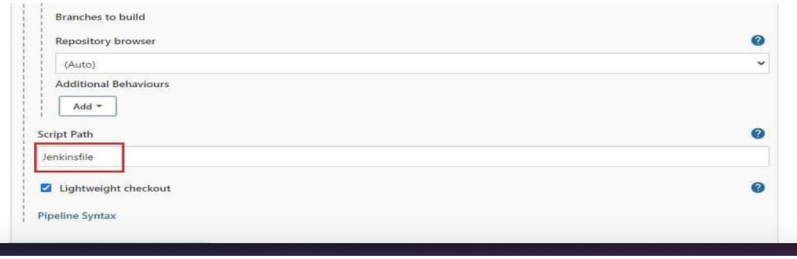




3. Now, you will get an option to input your *Repository URL* and *credentials*.



4. Next, you may set the ***branch*** or let it be blank for any branch. In the script path, you need to write the ***Jenkinsfile*** name that exists in your repository. Click on ***Save***, and there you go, your declarative pipeline is ready for use.



JenkinsFile Data

Key concepts of Jenkinsfile

- ***Pipeline*** *- A pipeline is a set of instructions that includes the processes of continuous delivery. For example, creating an application, testing it, and deploying the same. Moreover, it is a critical element in declarative pipeline syntax, which is a collection of all stages in a Jenkinsfile. We declare different stages and steps in this block.*
- pipeline{ } ***Node*** *- A node is a key element in scripted pipeline syntax. Moreover, it acts as a machine in Jenkins that executes the Pipeline.*
- node{ } ***Stage*** *- A stage consists of a set of processes that the Pipeline executes. Additionally, the tasks are divided in each stage, implying that there can be multiple stages within a Pipeline. The below snippet shows the different stages that one can define in a Pipeline.*
- ***Steps*** *- A step in Jenkins defines what we have to do at a particular step in the process. There can be a series of steps within the stage. Moreover, whatever step we define in a stage would be executed within it.*
- ***Agent*** *- An agent is a directive that enables the users to execute multiple projects within the same Jenkins instance by distributing the load. Moreover, we assign an executor to the build through an agent. You can either use a single agent for the entire pipeline or use a distinct agent for the different stages of the pipeline. Subsequently, some of the parameters used with agents are -*
  - ***Any****- Any of the available agents execute the pipeline.*
  - ***None****- It is used at the pipeline root and implies no global agent, but each stage must specify its own agent.*
  - ***Label****- The labeled agent is used to execute the pipeline or the specific stage.*
  - ***Docker****- One can use the Docker images as the execution environment & specifying the agent as docker.*

Merge Request from dev to master Branch

Child Pipeline -

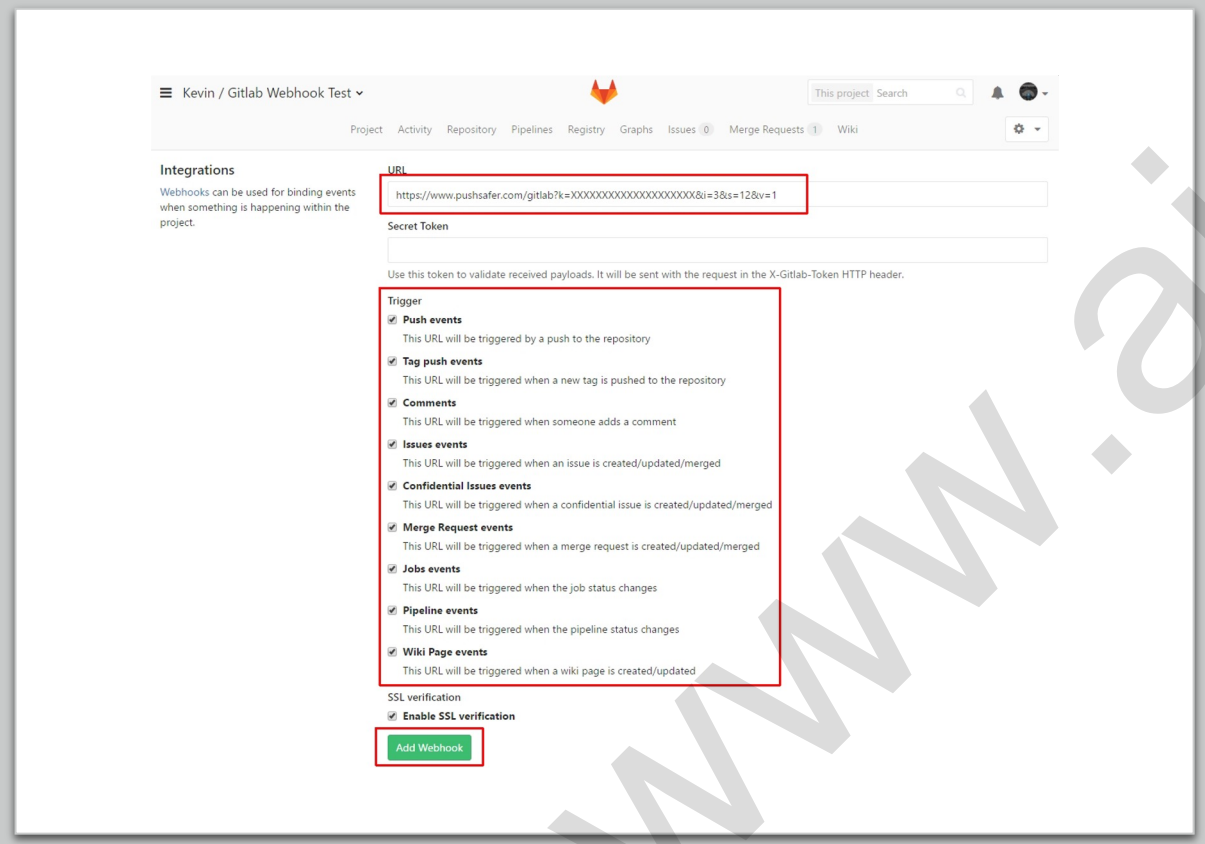
DevTeam Code Commit To GitHub Triggers Child Pipeline (WebHook) Sonar/Blackduck/Fortify(Stage 1 - In Parallel) Creates the Merge Request(Stage 2 – Sends Email to Approver)

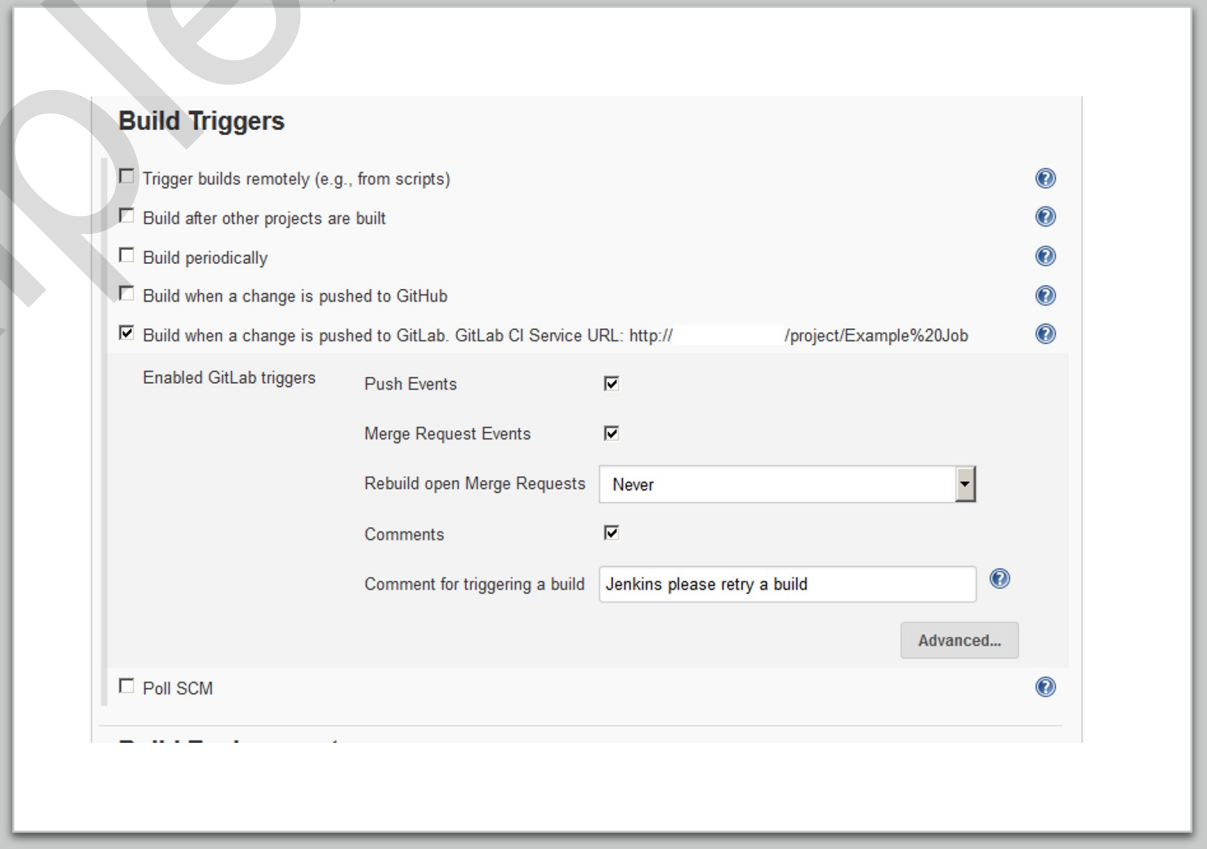
Master Pipeline -

Merge request gets approved Master Pipeline Trigger(WebHook) Sonar/Blackduck/Fortify(Stage 1 - In Parallel) Build Code (Maven) Artifact Push (Jfrog) Pull Artifact(Ansible) Deployment to QA(OnPrem/Cloud) Performance testing/Integration testing Deployment to Syage Send Notification via Email

Webhook Setup

- In your project or group, on the left sidebar, select Settings > Webhooks.
- In URL, enter the URL of the webhook endpoint.
- In Secret token, enter the secret token to validate payloads.
- In the Trigger section, select the events to trigger the webhook





Trigger a pipeline from JenkinsFile

```
pipeline {
    agent
    {
        node {
                label 'master'
                customWorkspace "${env.JobPath}"
              }
    }

    stages
    {
        stage('Start') {
            steps {
                sh 'ls'
            }
        }

        stage ('Invoke_pipeline') {
            steps {
                build job: 'pipeline1', parameters: [
                string(name: 'param1', value: "value1")
                ]
            }
        }

        stage('End') {
            steps {
                sh 'ls'
            }
        }
    }
}
```

```
pipeline {
    agent {
        docker {
            image 'node:6-alpine'
            args '-p 3000:3000 -p 5000:5000'
        }
    }
    environment {
        CI = 'true'
    }
    stages {
        stage('Build') {
            steps {
                sh 'npm install'
            }
        }
        stage('Test') {
            steps {
                sh './jenkins/scripts/test.sh'
            }
        }
        stage('Deliver for development') {
            when {
                branch 'development'
            }
            steps {
                sh './jenkins/scripts/deliver-for-development.sh'
                input message: 'Finished using the web site? (Click "Proceed" to continue)
                sh './jenkins/scripts/kill.sh'
            }
        }
        stage('Deploy for production') {
            when {
                branch 'production'
            }
            steps {
                sh './jenkins/scripts/deploy-for-production.sh'
                input message: 'Finished using the web site? (Click "Proceed" to continue)
                sh './jenkins/scripts/kill.sh'
            }
        }
    }
}
```

PROJECT SETUP IS IN HANDSON DOCUMENT