Continuous Integration

Introduction to Jenkins

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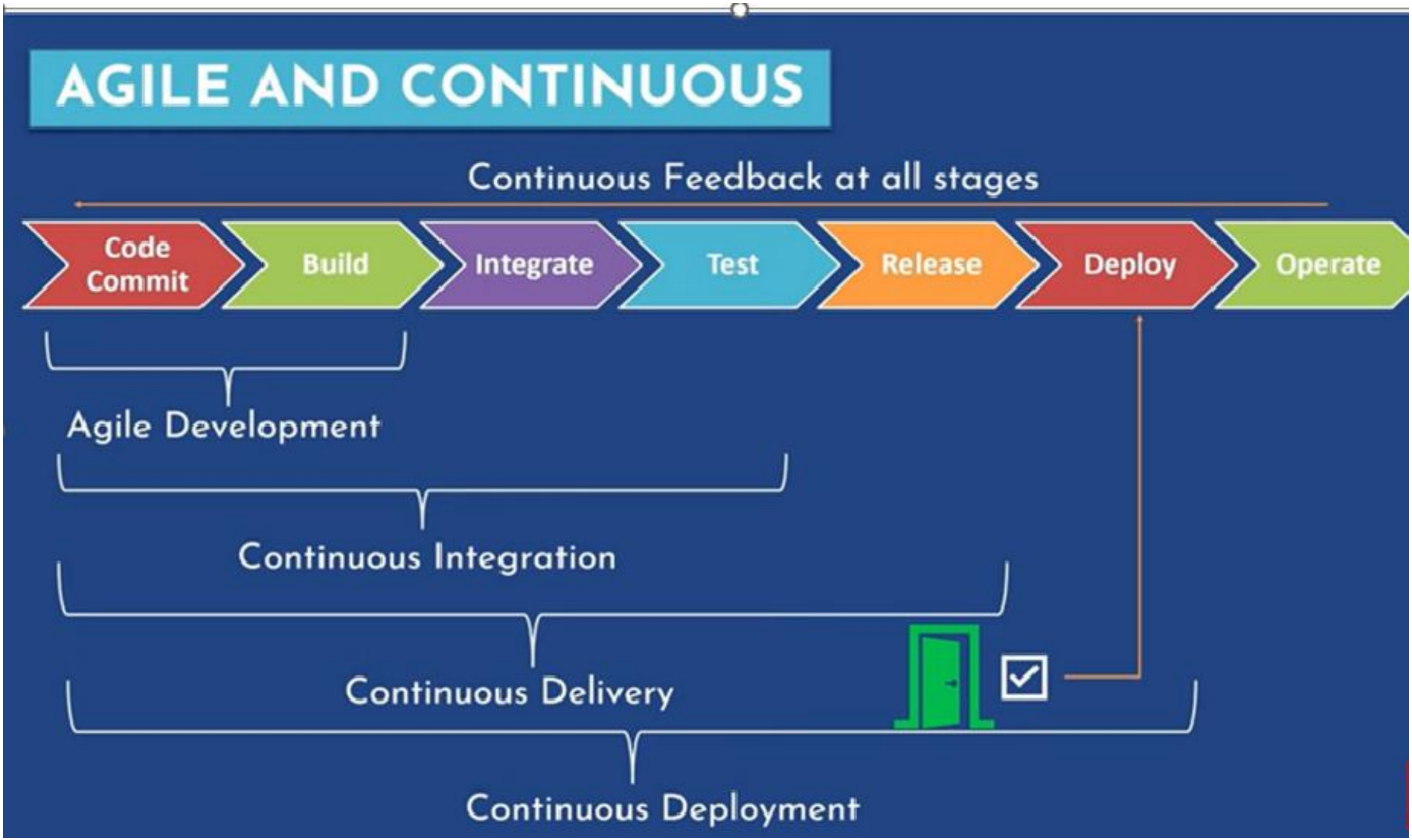
AGILE AND CONTINUOUS
Continuous Feedback at all stages
Code Commit
Build
Integrate
Test
Release
Deploy
Operate
Agile Development
Continuous Integration
Continuous Delivery
Continuous Deployment

Aspect	Continuous Delivery	Continuous Deployment
Manual Approval	Yes	No
Automation Level	High, but final step is manual	Fully automated
Deployment Frequency	On-demand, after manual review & approval	Immediately, following each successful build
Risk Level	Lower, due to human oversight	Higher, mitigated by extensive automation
Typical Use Cases	Regulated industries, critical systems	Fast-paced, agile teams, non-critical updates

Introduction to **Jenkins**

- Jenkins is an open-source automation server used for –
  - continuous integration (CI) and
  - continuous delivery (CD) in software development.
- It helps developers automate the process of building, testing, and deploying applications.

Key Features of Jenkins

- **Automation**: Automates repetitive tasks like code compilation, testing, and deployment.
- **CI/CD Pipeline**: Supports building and integrating code frequently to detect issues early.
- **Plugins Support**: Over 1,800 plugins for integrating with various tools like Git, Docker, Kubernetes, Maven, etc.
- **Distributed Builds**: Can run builds on multiple machines to speed up execution.

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Jenkins Installation

Jenkins Installation on Windows – setup

- The simplest way to install Jenkins on Windows is to use the Jenkins Windows installer (.msi file).
- That program will install Jenkins as a service using a 64-bit JVM chosen by the user.
- Keep in mind that to run Jenkins as a service, the account that runs Jenkins must have permission to login as a service.

Jenkins Installation on Windows – setup

- Prerequisites
  - Minimum hardware requirements:
    - 256 MB of RAM
    - 1 GB of drive space (although 10 GB is a recommended minimum if running Jenkins as a Docker container)
  - Recommended hardware configuration for a small team:
    - 4 GB+ of RAM
    - 50 GB+ of drive space

Jenkins Installation on Windows – setup

- Prerequisites
  - Software requirements:
    - Java (Java 17 or Java 21)
    - Any Web browser (Updated)

Jenkins Installation on Windows – setup

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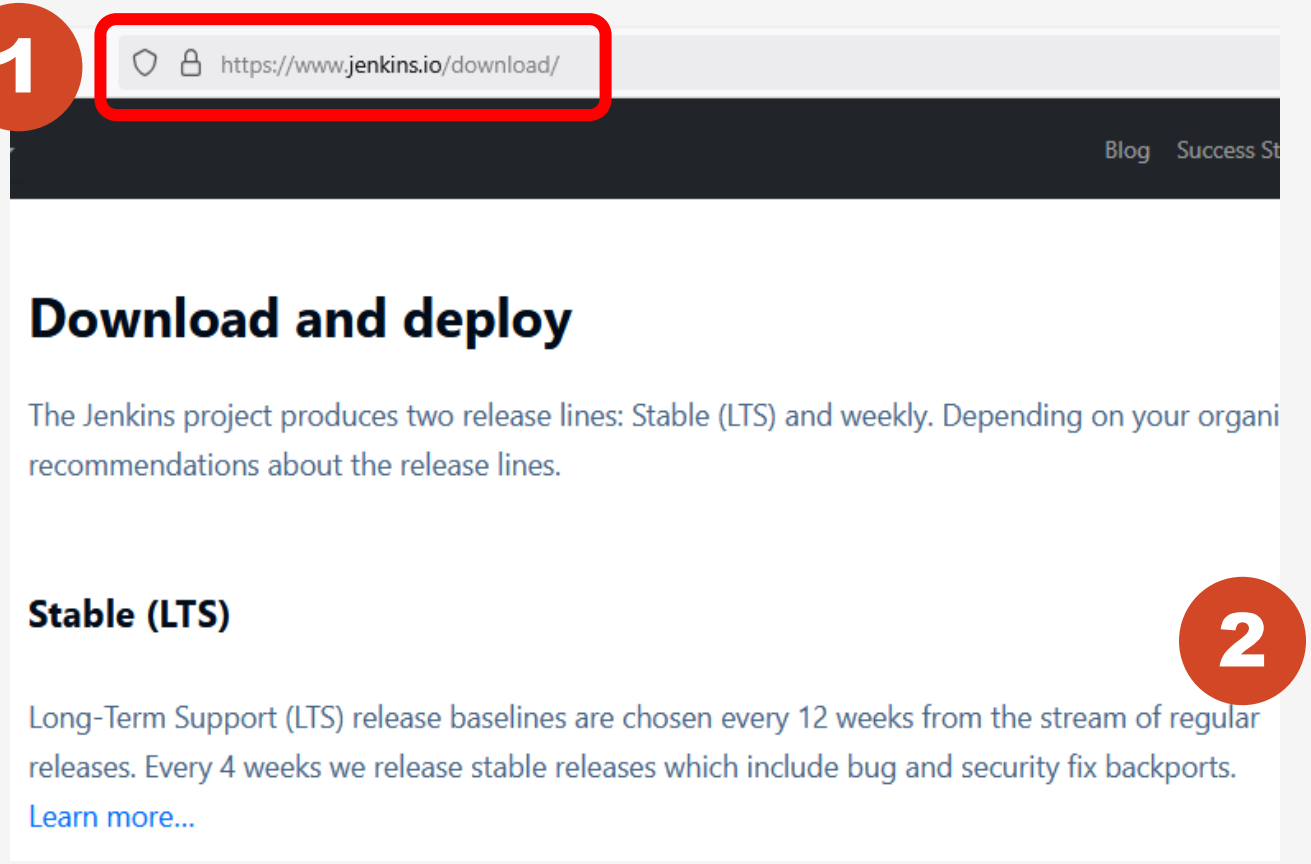

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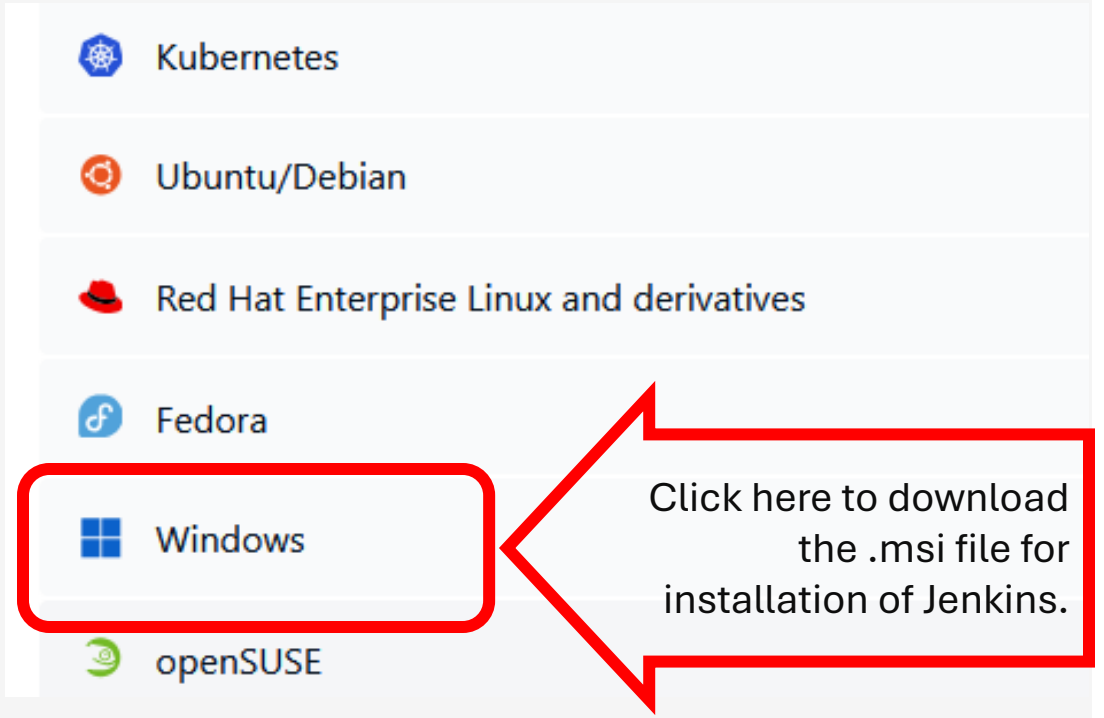
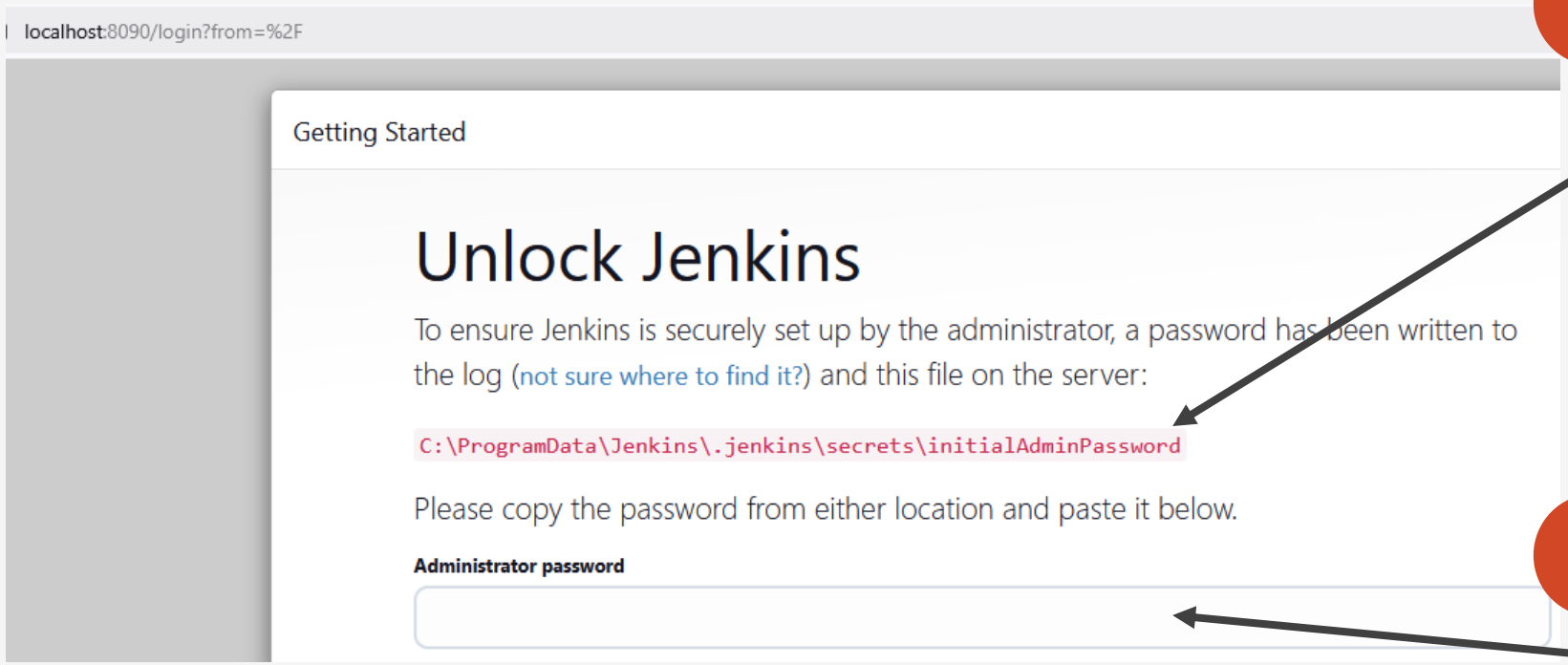


Running Jenkins using PowerShell to install default plugins



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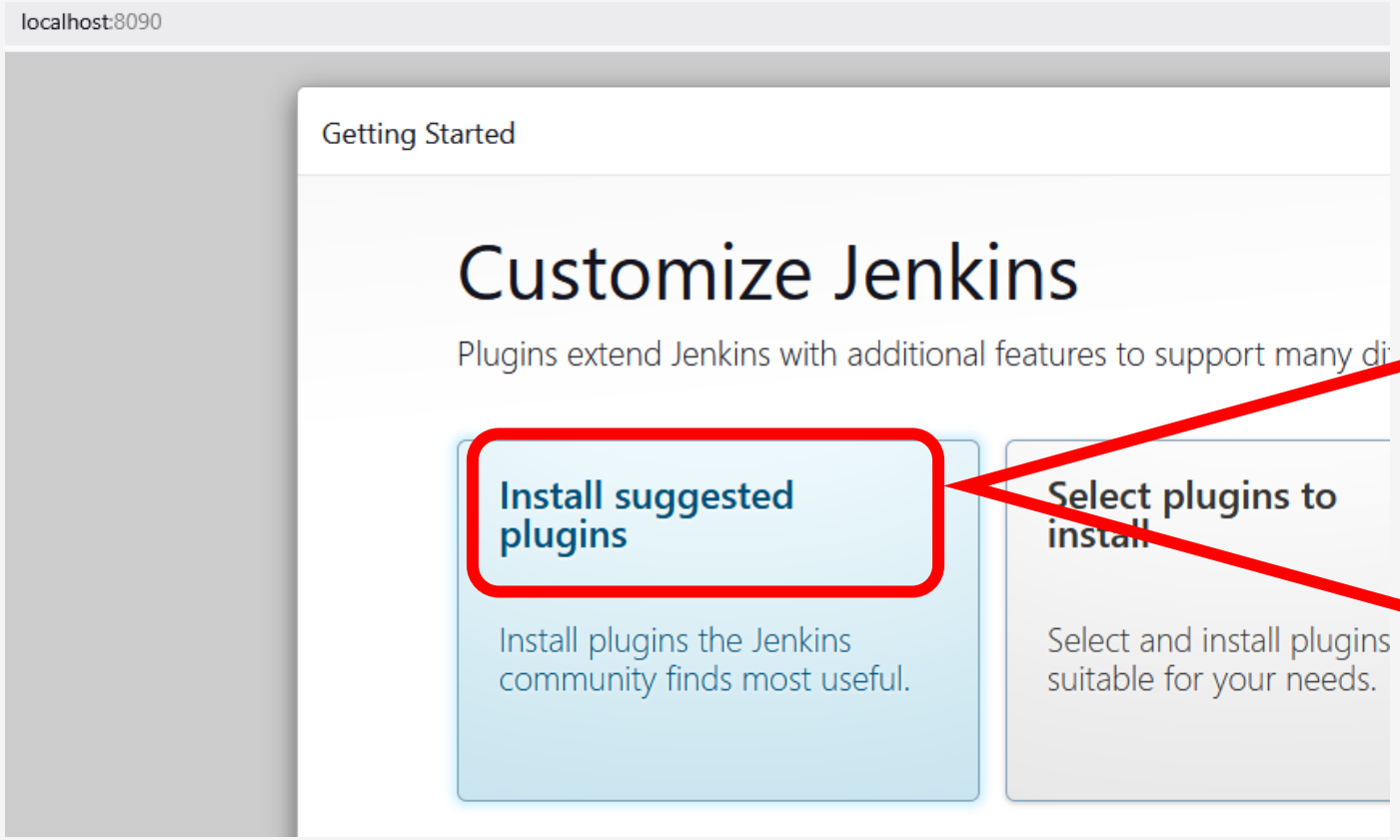
Copy the given path and paste it in file explorer to open a Notepad file wherein a password for login is present.

2

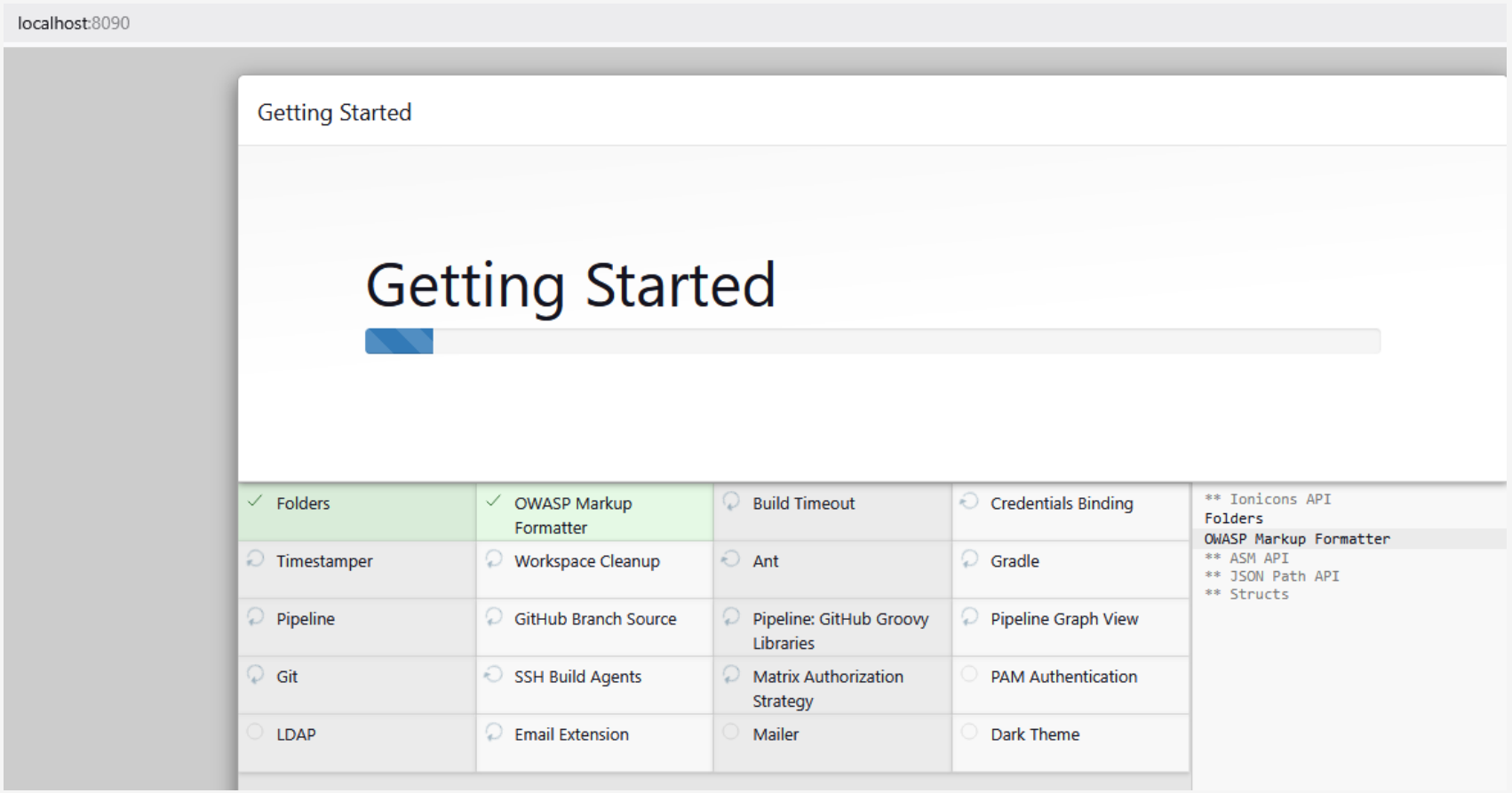
Copy the password and paste it here.

Running Jenkins using PowerShell to install default plugins

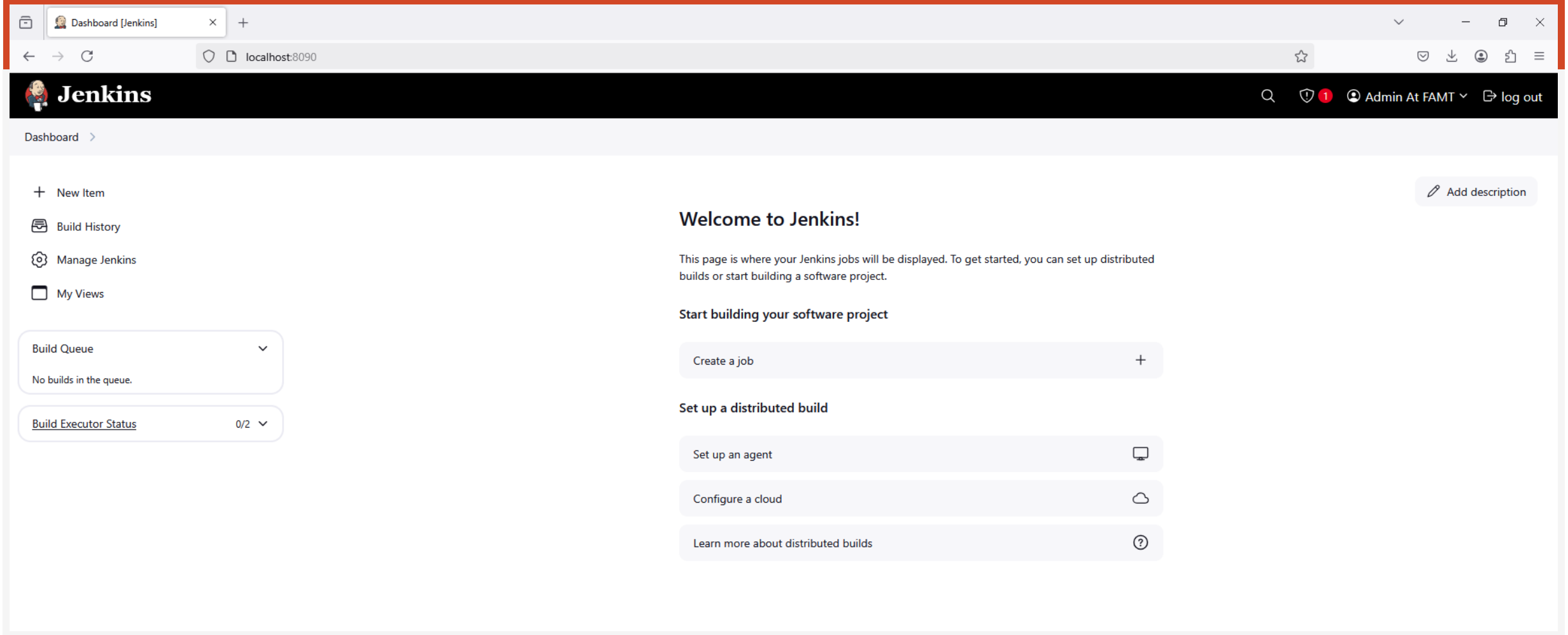


Click here to install required plugins for running the Jenkins.

Running Jenkins using PowerShell to install default plugins



Jenkins Dashboard



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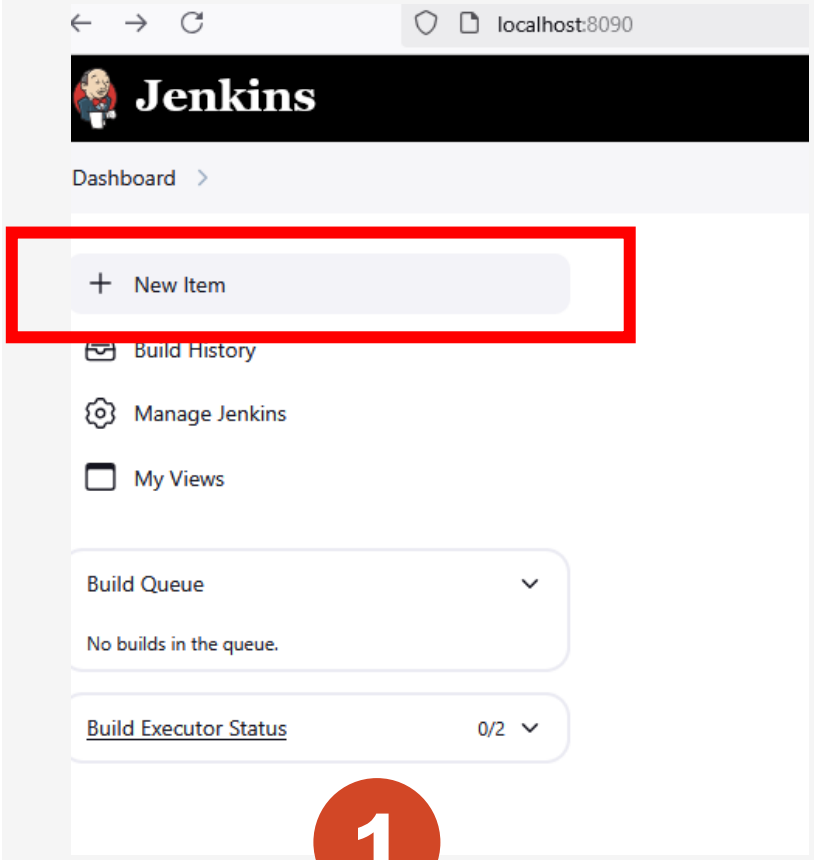
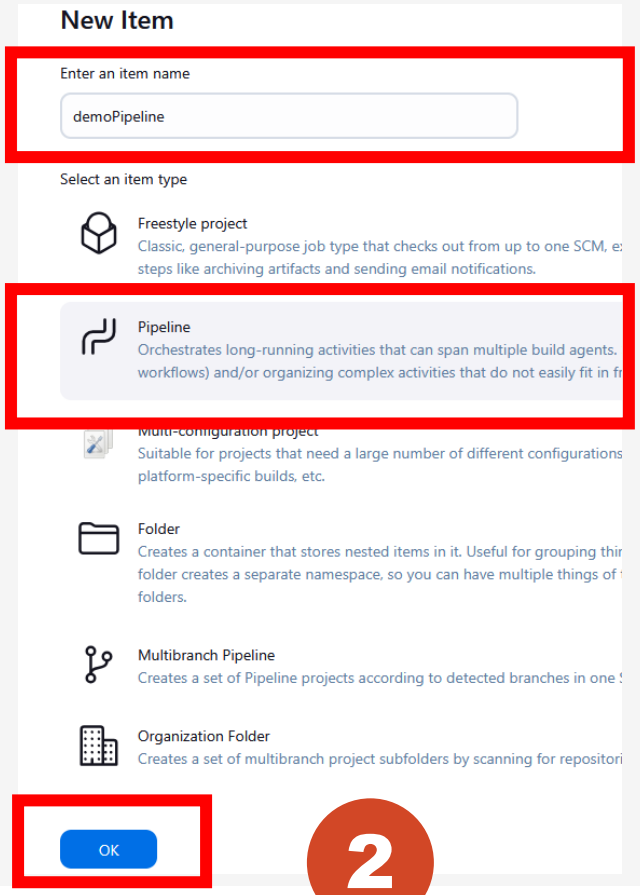
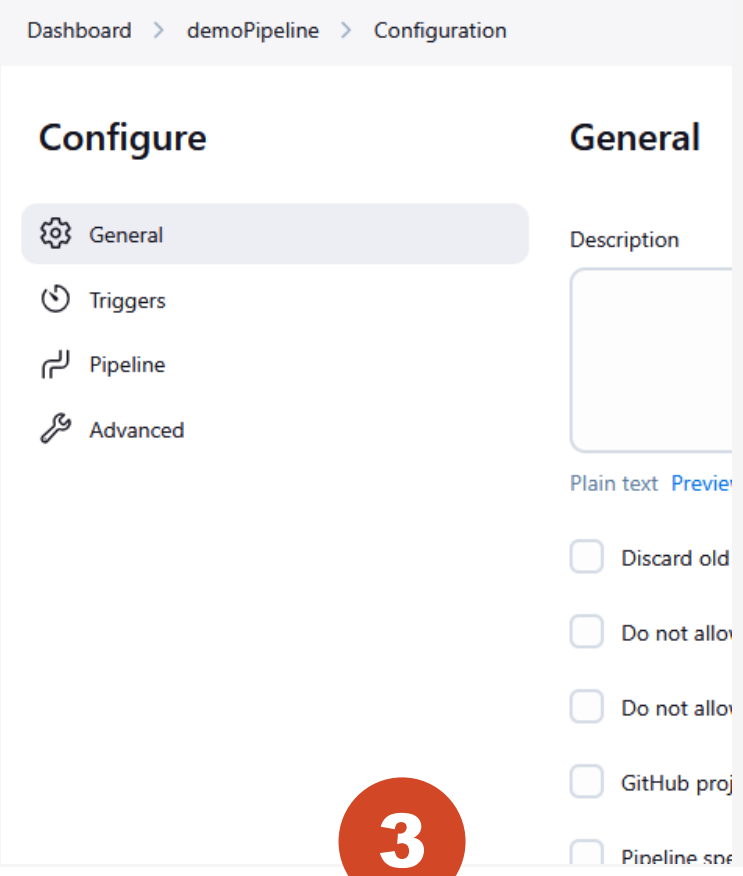
Setting up a CI/CD pipeline for a web development

Setting up a demo pipeline







Setting up a demo pipeline

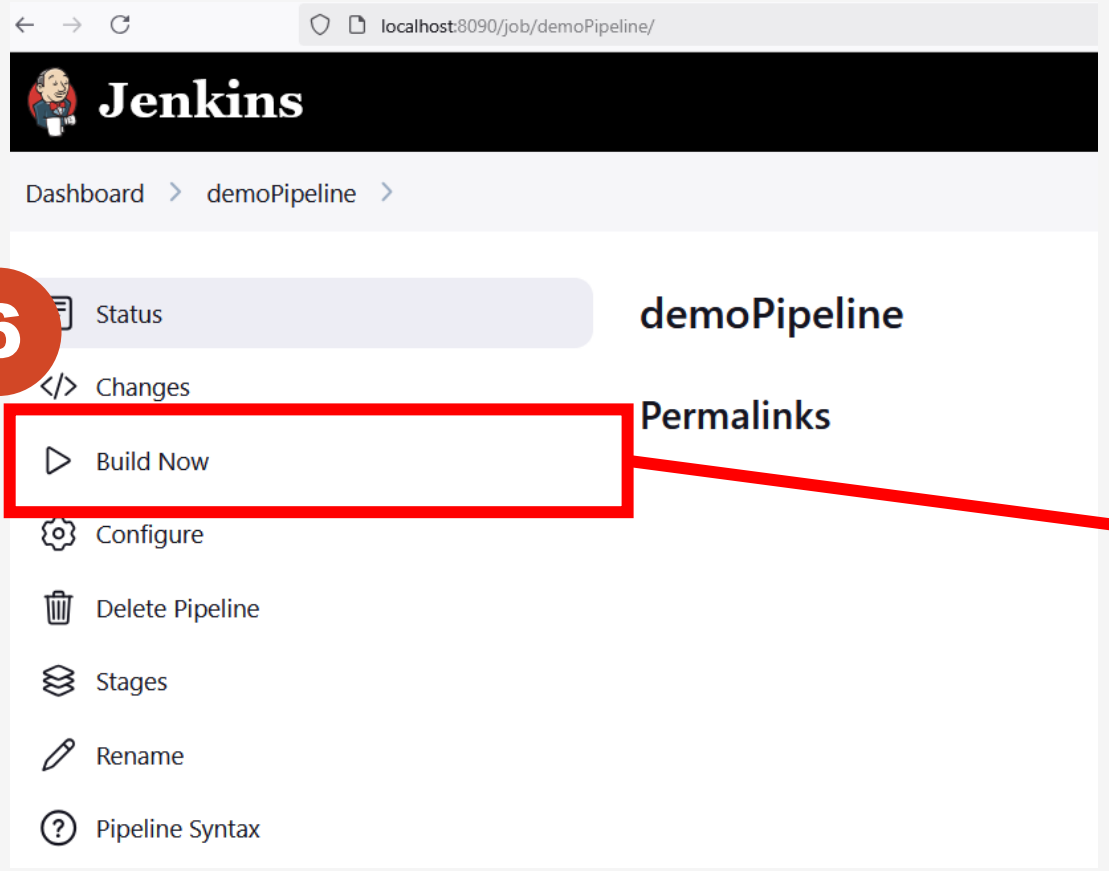
4 **Scroll down the “Configure” page up to “Pipeline” section to write a script for the demo pipeline.**

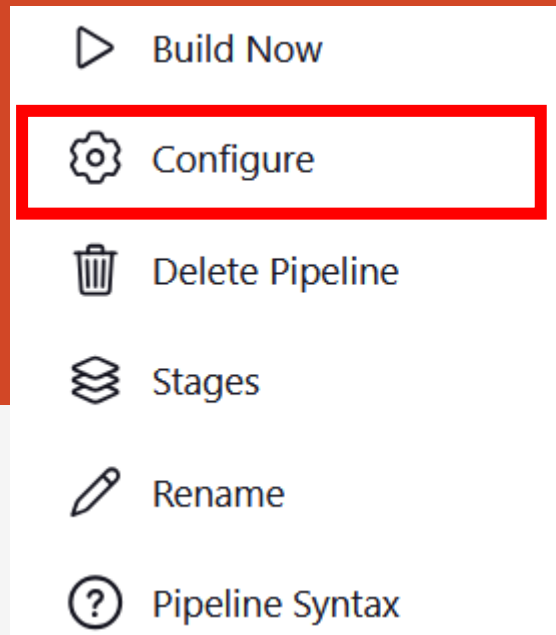
5 **Scroll down to click “Save” button to save the pipeline.**

Script ?

```
pipeline {
    agent any  // Defines where the pipeline runs

    stages {
        stage('Build') { // Defines a step in the pipeline
            steps {
                echo 'Building the project...'  // Print message to console
            }
        }

        stage('Test') {
            steps {
                echo 'Running tests...'
            }
        }

        stage('Deploy') {
            steps {
                echo 'Deploying the application...'
            }
        }
    }

    post {
        success {
            echo 'Pipeline completed successfully!'  // Runs if the pipeline is successful
        }
        failure {
            echo 'Pipeline failed!'  // Runs if any stage fails
        }
    }
}
```

Setting up a demo pipeline





If you want to edit pipeline again then use “Configure”

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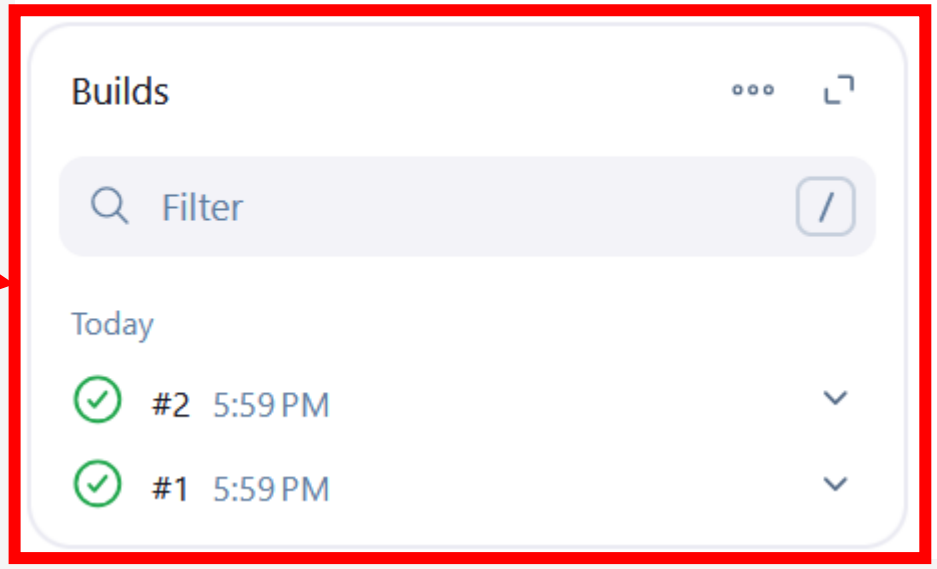
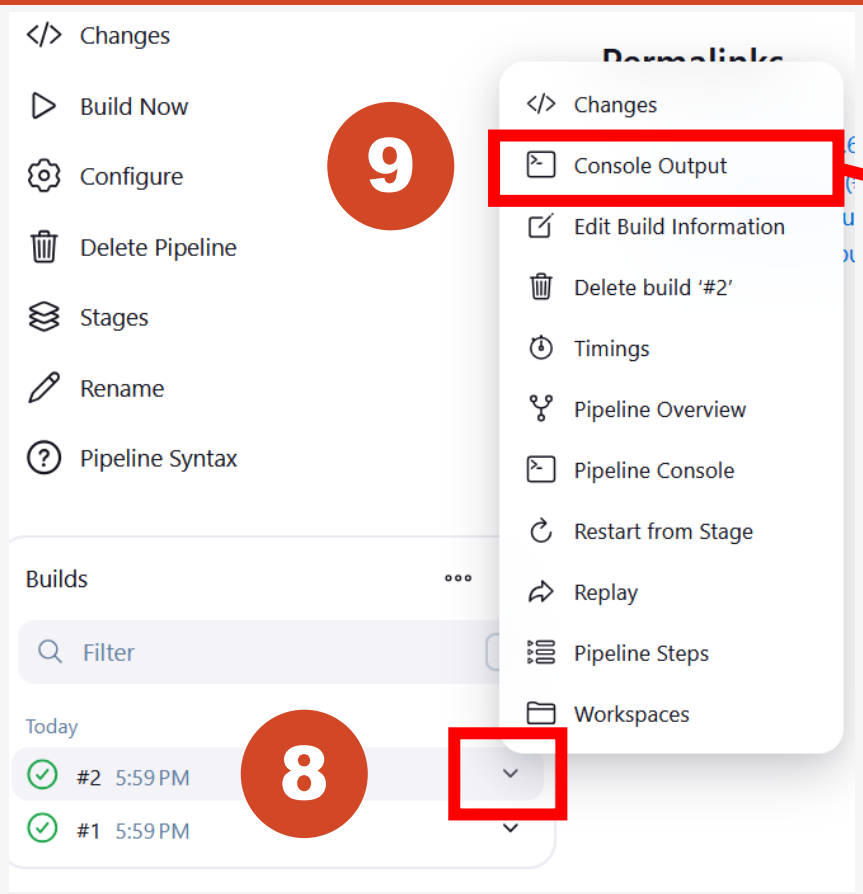
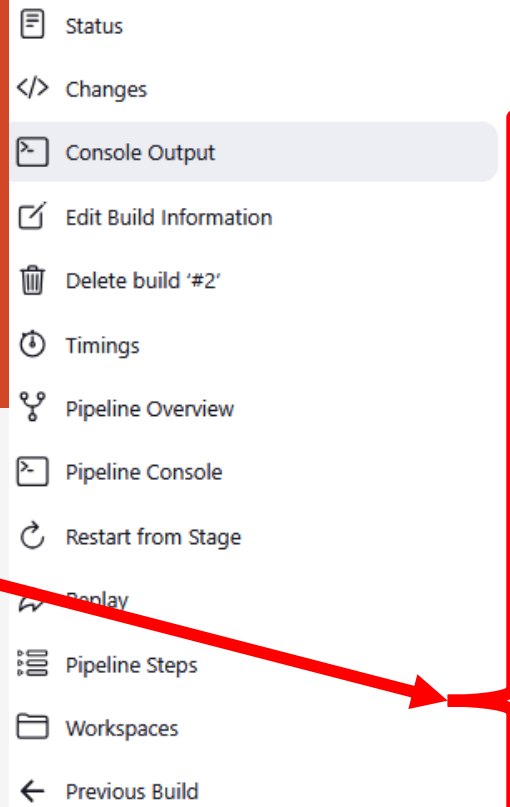


Setting up a demo pipeline





Console Output

```
Started by user Admin At FAMT
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in C:\ProgramData\Jenkins\.jenkins\workspace\demoPipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Build)
[Pipeline] echo
Building the project...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Test)
[Pipeline] echo
Running tests...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] echo
Deploying the application...
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Declarative: Post Actions)
[Pipeline] echo
Pipeline completed successfully!
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```