

# Jenkins



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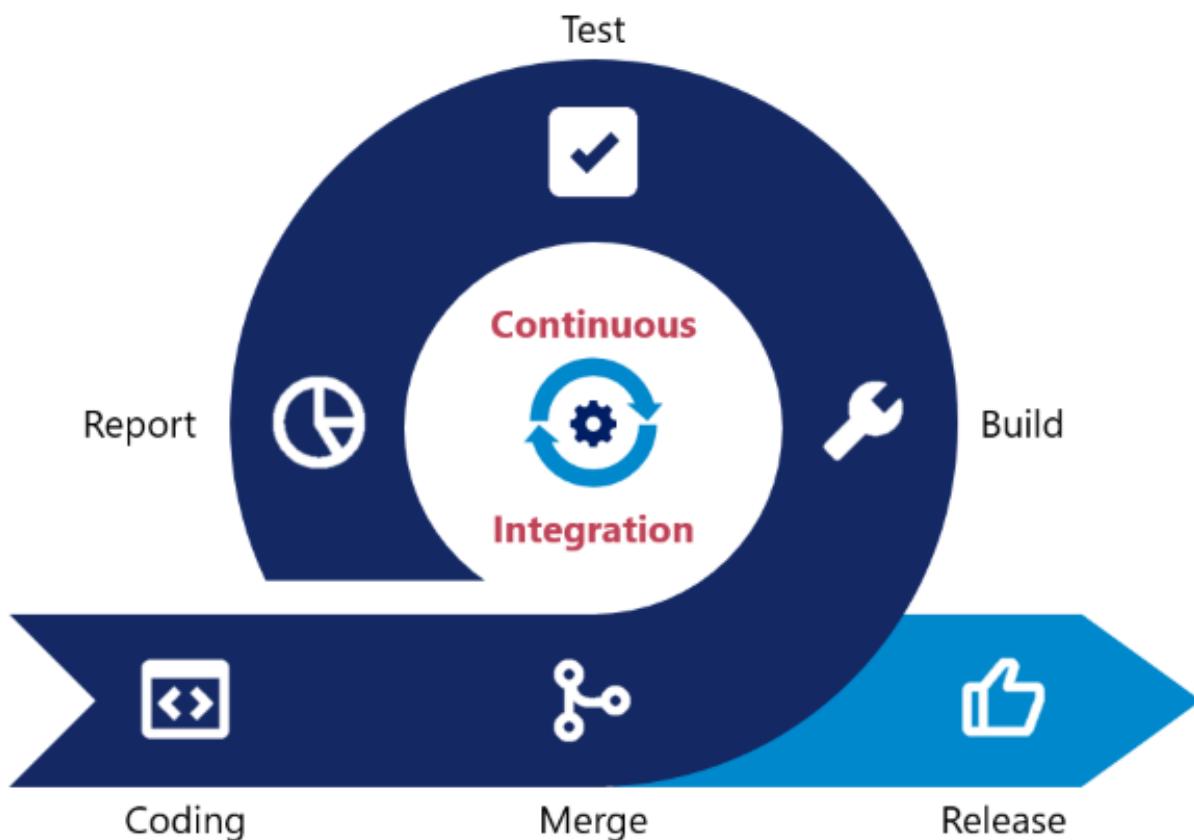
# Jenkins

هي CI/CD Tool ، طيب هو أوي ال CI/CD دا ؟

: continuous integration CI اختصار ل

هي اني بخلي عملية ال release بتاع ال Change او أوي New Feature يكون بشكل Automated .

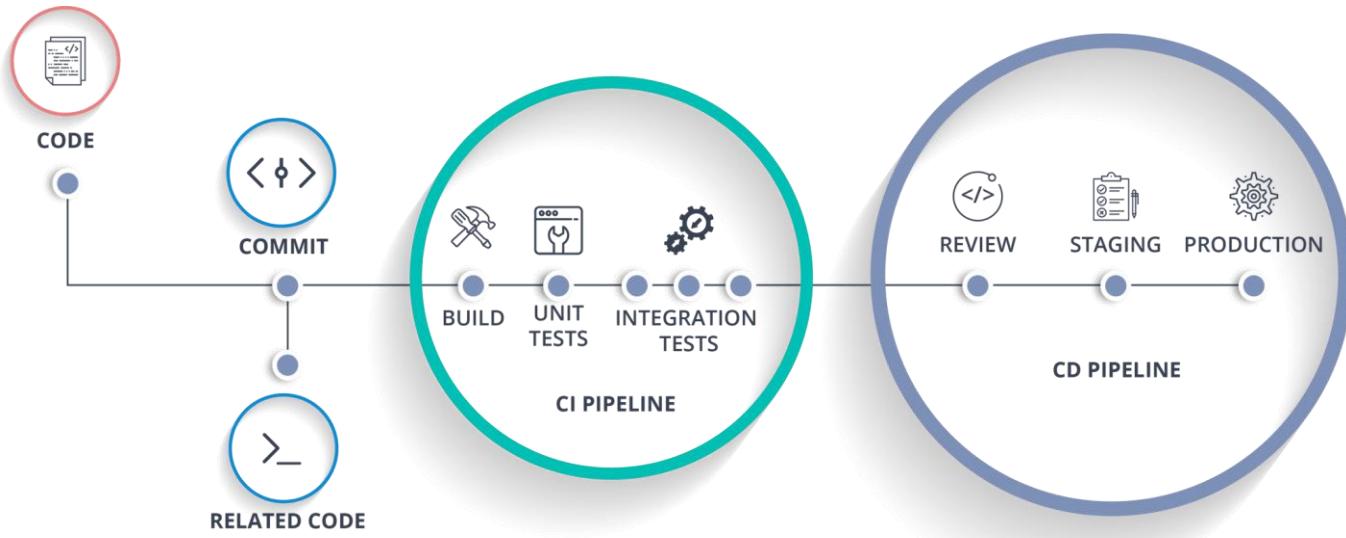
الفكرة اني ببقا عندي Central Repo عليه ال change واي Code تحصل على ال repo دا بعد كدا ال CI/CD من خلالها لما يحصل Repo على ال Change دا يحصل Build على ال Build داه يعمل 3 حاجات : هي عمل Test و artifacts push و artifacts Test .



continuous delivery/deployment CD اختصار ل

ال Automated Build : لم ال deploy بيحصل ال continuous deployment على كل حاجه عندي سواء ال Testing او ال Production لكن ال

Approve : بيجي عند ال Production وببستي من شخص عشان ال Production او ال deploy يحصل علي ال push



ال Tools الخاصة بال CI/CD كتير جدا وعشان كدا مهم انك تكون فاهم ال Concept

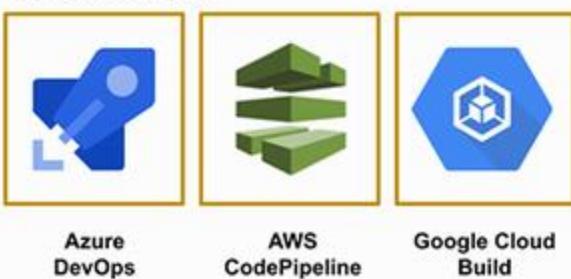
### Open Source



### SaaS



### Cloud Services



طيب ليه نستخدم ال Jenkins ؟

1- أنها open Source

2- أنها Java Based و دا بيساعد في أنها تشغلى على أي OS

3- فيه منها ال Enterprises Free وال

4- ليها اكتر من 1500 Plugins

5- ليها Community كبير

6- SCM Integration

: Install Jenkins

عشان اعمل Install لل Jenkins في اكتر من طريقة

Windows-1

Linux-2

Docker-3

K8s-4

ومن خالل اللينك دا تقدر تشوف الطريقة المناسبة

<https://www.jenkins.io/doc/book/installing>

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بعد م بتعمل Install هندا نعمل الخطوات دي عشان نبدا نشتغل علي ال Jenkins



بعمل Unlock لل Jenkins من خلال ال admin password ودا نقدر تعرفه من اكتر من مكان وهو يكون كاتبلك ال Path

```
[root@192 secrets]# cat /var/lib/docker/volumes/jenkins_home/_data/secrets/initialAdminPassword
546aff02a41d47e484298e8758e1ea93
[root@192 secrets]#
```

```
[root@192 ~]# sudo docker exec jenkins cat /var/jenkins_home/secrets/initialAdminPassword
546aff02a41d47e484298e8758e1ea93
[root@192 ~]#
```

# Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

`/var/jenkins_home/secrets/initialAdminPassword`

Please copy the password from either location and paste it below.

Administrator password

\*\*\*\*\*

Continue

# Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

## Install suggested plugins

Install plugins the Jenkins community finds most useful.

## Select plugins to install

Select and install plugins most suitable for your needs.

## Getting Started

# Getting Started

✓ Folders	✓ OWASP Markup Formatter	Build Timeout	✓ Credentials Binding	on Framework
✓ Timestamper	⌚ Workspace Cleanup	⌚ Ant	⌚ Gradle	(JAF) API ** JAXB ** SnakeYAML API ** JSON API ** Jackson 2 API ** commons-text API ** Pipeline: Supporting APIs ** Plugin Utilities API ** Font Awesome API ** Bootstrap 5 API ** JQuery3 API ** ECharts API ** Display URL API ** Checks API ** JUnit ** Matrix Project ** Resource Disposer ** - required dependency
⌚ Pipeline	⌚ GitHub Branch Source	⌚ Pipeline: GitHub Groovy Libraries	⌚ Pipeline Graph View	
⌚ Git	⌚ SSH Build Agents	⌚ Matrix Authorization Strategy	⌚ PAM Authentication	
⌚ LDAP	⌚ Email Extension	⌚ Mailer	⌚ Dark Theme	

Jenkins 2.452.2

ببيدا يعمل Install لـ Plugins

## Getting Started

# Create First Admin User

Username

admin

Password

\*\*\*\*\*

Confirm password

\*\*\*\*\*

Jenkins 2.452.2

Skip and continue as admin

Save and Continue

يطلب منك تعلم admin user وممكن تعلم Skip

# Instance Configuration

Jenkins URL:

http://192.168.93.130:8080/

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the `BUILD_URL` environment variable provided to build steps.

The proposed default value shown is **not saved yet** and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

Jenkins 2.452.2

Not now

Save and Finish

بعد کدا بیدیک ال URL

## Getting Started

# Jenkins is ready!

Your Jenkins setup is complete.

[Start using Jenkins](#)

وبيقولك ان ال Setup تمام وتقدر تبدا شغل علي ال Jenkins

The screenshot shows the Jenkins dashboard. On the left, there's a sidebar with links: '+ New Item', 'Build History', 'Manage Jenkins', and 'My Views'. Below these are two dropdown menus: 'Build Queue' (No builds in the queue) and 'Build Executor Status' (1 Idle, 2 Idle). The main area has a search bar 'Search (CTRL+K)' and user info 'Admin'. A large 'Welcome to Jenkins!' header is followed by a sub-header 'Start building your software project'. It includes a 'Create a job' button and sections for 'Set up a distributed build' (with 'Set up an agent' and 'Configure a cloud' buttons). A note says: 'This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.'

وهي ال Dashboard الخاصة بال Jenkins

The screenshot shows the 'Manage Jenkins' page. The left sidebar has links: '+ New Item', 'People', 'Build History', 'Manage Jenkins' (which is selected), and 'My Views'. Below these are the same 'Build Queue' and 'Build Executor Status' dropdowns as the dashboard. The main area is titled 'Manage Jenkins' and contains several configuration sections: 'System Configuration' (with 'System', 'Tools', 'Plugins', 'Clouds', 'Appearance', and 'Nodes' sub-sections), 'Security' (with 'Security', 'Credentials', 'Credential Providers', and 'Users' sub-sections). Each section has a brief description and a link to its configuration page.

هي ال Manage Jenkins

: هندخل على ال System

# System

## Home directory ?

By default, Jenkins stores all of its data in this directory on the file system

/var/jenkins\_home 

هنا دا ال Path ال Jenkins بيخزن فيه كل حاجه تخصه

Plain text [Preview](#)

# of executors

2

Labels

دا يعني اقدر اعمل كام job في نفس الوقت (يعني عدد ال pipeline ال اقدر اعملها في نفس الوقت).

## Labels

دي لو عاوز ادي ال Jenkins اسم معين

## Usage ?

Use this node as much as possible

Use this node as much as possible

Only build jobs with label expressions matching this node

5

: Use this node as much as possible

دي لو محدش محدد ال pipeline يعمل run فين يجي يعمل run على ال Master دي

: Only build jobs with label expressions matching this node

دي لا ميعملش Run غير لو انا محدله ان ال pipeline run في ال node دي

### Build Queue

No builds in the queue.

### Build Executor Status

1 Idle

2 Idle

### Quiet period

5

هنا لو عندي pipeline بيدخل عطول علي ال executor ولا يستني مثلا 5 ثواني اهي ال 5 ثواني دي  
هي ال Quiet period

### SCM checkout retry count

2

لو الدنيا حصلها failed وهو بيعمل clone من ال github يحاول كام مره ثاني

## Pipeline Speed / Durability

### Default Speed / Durability Level ?

None: use pipeline default (MAX\_SURVIVABILITY)

**None: use pipeline default (MAX\_SURVIVABILITY)**

Performance-optimized: much faster (requires clean shutdown to save running pipelines)

Less durability, a bit faster (specialty use only)

Maximum durability but slowest (previously the only option)

### Usage Statistics

Help make Jenkins better by sending anonymous usage statistics and crash reports to the Jenkins project ?

ال Max دی لو ال Jenkins وقع ورجع هيكل من مكان ما يوقف

ال less دی لو وقع هيرجع بيدا من الأول

ال ال performance دی ما بين الاثنين

## Timestamper

### System clock time format ?

'<b>'HH:mm:ss'</b> '

### Elapsed time format ?

'<b>'HH:mm:ss.S'</b> '

Enabled for all Pipeline builds ?

دي الفورمات بناء التاريخ

Dashboard > Manage Jenkins > Plugins

## Plugins

Updates Available plugins (Selected) Installed plugins Advanced settings Download progress

Search available plugins

Install Name ↓ Released

	Name	Released
<input type="checkbox"/>	Command Agent Launcher 107.v773860566e2e Agent Management	6 mo 2 days ago
<input type="checkbox"/>	Oracle Java SE Development Kit Installer 73.vddf737284550 Allows the Oracle Java SE Development Kit (JDK) to be installed via download from Oracle's website.	6 mo 6 days ago
<input type="checkbox"/>	JSch dependency 0.2.16-86.v42e010d9484b_ Library plugins (for use by other plugins) Miscellaneous	1 mo 3 days ago

دي ال موجوده وال اقدر استخدماها في ال Jenkins plugins

## Security

<b>Security</b> Secure Jenkins; define who is allowed to access/use the system.	<b>Credentials</b> Configure credentials	<b>Credential Providers</b> Configure the credential providers and types
<b>Users</b> Create/delete/modify users that can log in to this Jenkins.	<b>In-process Script Approval</b> Allows a Jenkins administrator to review proposed scripts (written e.g. in Groovy) which run inside the Jenkins process and so could bypass security restrictions. 1 scripts pending approval.	--

لو من ال اختارت ال Security list هيعمل بكل ال اقدر اعمله ومنها :

--



# Jenkins

Dashboard > Manage Jenkins > Security

## Security

### Authentication



Disable "Keep me signed in"

### Security Realm

Jenkins' own user database

Delegate to servlet container

Jenkins' own user database

LDAP

Unix user/group database

None

**Save**

**Apply**

في ال Authorization هلاقی ال Authentication وال Security

ال Users دی ال DB ال بیتخرن فيها ال security Realm

--

Jenkins' own user database

Allow users to sign up ?

#### Authorization

Logged-in users can do anything

Anyone can do anything

Legacy mode

Logged-in users can do anything

Matrix-based security

Project-based Matrix Authorization Strategy

دي الحاجات ال بعمل Manage Plugin بيه لـ Authorization بتساعدني في اني اعمل  
بطريقه افضل لـ Authorization ال Manage plugin دى اسمها

#### Role-Based Authorization Strategy

The screenshot shows the Jenkins Plugins page. The navigation bar at the top includes the Jenkins logo, a search bar with placeholder "Search (CTRL+K)", and an "Admin" dropdown. Below the header, the breadcrumb navigation shows "Dashboard > Manage Jenkins > Plugins". On the left, there's a sidebar with options: "Updates" (disabled), "Available plugins" (selected and highlighted in blue), "Installed plugins", and "Advanced settings". The main content area displays a list of available plugins. A specific plugin, "Role-based Authorization Strategy", is highlighted with a checkmark in its "Install" checkbox. The plugin details show it was released 1 month and 25 days ago, is under the "Security" category, and is used for "Authentication and User Management". A brief description states: "Enables user authorization using a Role-Based strategy. Roles can be defined globally or for particular jobs or nodes selected by regular expressions." An "Install" button is visible to the right of the plugin listing.

دخل على ال plugin وعملها install

Jenkins' own user database

|  Allow users to sign up ?

#### Authorization

Logged-in users can do anything

**Anyone can do anything**

Legacy mode

Logged-in users can do anything

Matrix-based security

Project-based Matrix Authorization Strategy

Role-Based Strategy

#### Markup Formatter

لما ارجع على ال Authorization بلاقيها ظهرت معايا

#### Security



##### Security

Secure Jenkins; define who is allowed to access/use the system.



##### Credentials

Configure credentials



##### Credential Providers

Configure the credential providers and types



##### Manage and Assign Roles

Handle permissions by creating roles and assigning them to users/groups



##### Users

Create/delete/modify users that can log in to this Jenkins.

ولو رجعت على Security بلاقي tap جديد ظهرت خاصه بيها

Dashboard > Manage Jenkins > Manage and Assign Roles > Manage Roles

## Manage Roles

**Global roles**

Role	Overall	Credentials	Agent	Job	Run	Create	Configure	Move	Workspace	Delete	Read	Discover	Cancel	Build	Provision	Disconnect	Delete	Create	Connect	Configure	Build	View	Update	Administrator			
admin	<input checked="" type="checkbox"/>																										
Devops	<input checked="" type="checkbox"/>																<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
Testing																											

**Save** **Apply**

لو دخلت عليها بلاقي ان فكرتها role

بتعمل Role معينه وبعد كدا تعمل

Dashboard > Manage Jenkins > Manage and Assign Roles > Assign Roles

## Assign Roles

**Global roles**

User/Group	admin	Testing	Devops
Anonymous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Authenticated Users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Admin	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Add User** **Add Group**

User ل Assign

من هدخل على Manage Security في ال Tap الخاصه بال ودي مكان بخزن فيه ال Pipeline user and password عشان ميظهوش في ال

## New credentials

Kind

Username with password

Username with password

GitHub App

SSH Username with private key

Secret file

Secret text

Certificate

Username ?

دي الحاجات ال ممكن استخدامها ول يكن هعمل user and password

--

Username ?

Treat username as secret ?

Password ?

ID ?

Description ?

Create

بعد م بتكتب ال user وال password في حاجه اسمها ID

ال ID هو ال انت بتتده عليه داخل ال pipeline عشان يستخدم ال Credentials دي

+ New Item

Build History

Manage Jenkins

My Views

Open Blue Ocean

## Credential Providers

Providers

All available

Types

All available

Build Queue

No builds in the queue.

Restrictions

Add ▾

Build Executor Status

1 Idle

Save

Apply

من هدخل علي Security في ال Credential Providers بال الخاصه لكن يتم حفظها علي ال Cloud Credential Providers

## Users

+ Create User

These users can log into Jenkins. This is a sub set of [this list](#), which also contains auto-created users who really just made some commits on some projects and have no direct Jenkins access.

User ID ↓

Name



mostafa

Mostafa Mahmoud



من هدخل علي Users في ال Security الخاصه ومنها اقدر اضيف user



# Jenkins

Dashboard >

- + New Item
- People
- Build History
- Manage Jenkins
- My Views

ال pipeline create لـ new item هبذا اعمل

Enter an item name

» A job already exists with the name 'freestyle'

---

 **Freestyle project**  
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

 **Pipeline**  
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

 **Multi-configuration project**

ال freestyle نوع بسيط من

---

Plain text [Preview](#)

Discard old builds [?](#)

GitHub project

This project is parameterized [?](#)

Throttle builds [?](#)

Execute concurrent builds if necessary [?](#)

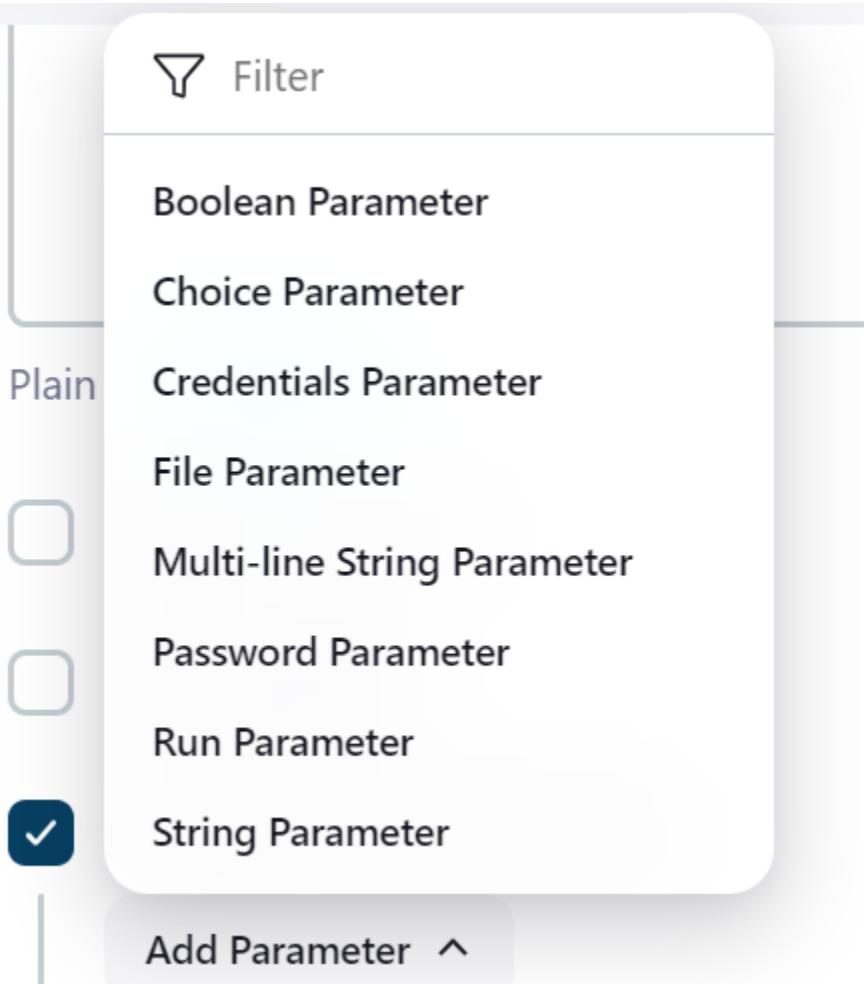
Advanced ▾

discard old builds-1 : بتحدد عدد او أيام معينة يسبلك فيها ال old build ودي حاجة مفيدة لأنه لو  
فضل يسيب كل ال old build ع المدى البعيد هي عمل مشكله في ال storge مثلًا هتتملي بسرعه لأنها  
فالآخر هي Jenkins files بتترمي ع ال

---

GitHub project-2 : دي لو تحتاج انك تعمل لينك لل project

دا مثلا قبل م تعمل run لل pipeline يكون فيه option بتختاره parameterized-3



هنا مثلا بحدده انها خلال ساعة او وقت معين يقدر يعمل run كام مره throttle builds-4

Throttle builds ?

Number of builds ?  
1

Approximately 60 minutes between builds

Time period ?  
Second

Allow user triggered builds to skip the rate limit ?

هنا مثلا لو ضغط على pipeline مرتين ورا بعض يعملها run مرتين نفس الوقت concurrent-5 لكن لو مفعتهاش فلو ضغطت مرتين هيعمل run للضغطة الاولى ويستني تخلص ويبدا في الثانية

## Configure

### Source Code Management

General

None

Source Code Management

Git

هنا لو عاوز ال code pipeline من ال GitHub يستدعي

Dashboard > automation > Configuration

## Configure

### Build Triggers

General

Trigger builds remotely (e.g., from scripts) ?

Source Code Management

Build after other projects are built ?

Build Triggers

Build periodically ?

Build Environment

GitHub hook trigger for GITScm polling ?

Poll SCM ?

بيحدد ال pipeline start ازاي وفيه اكتر من حاجه

script : بتعمله run عن طريق trigger-1

يتعمله run بعد pipeline run معين وفيه اكتر من حاجه انه يشتعل لو كان ال  
aborted او لو حصله failed ولا unstable والا stable pipeline

Build after other projects are built ?

Projects to watch

1 No project specified

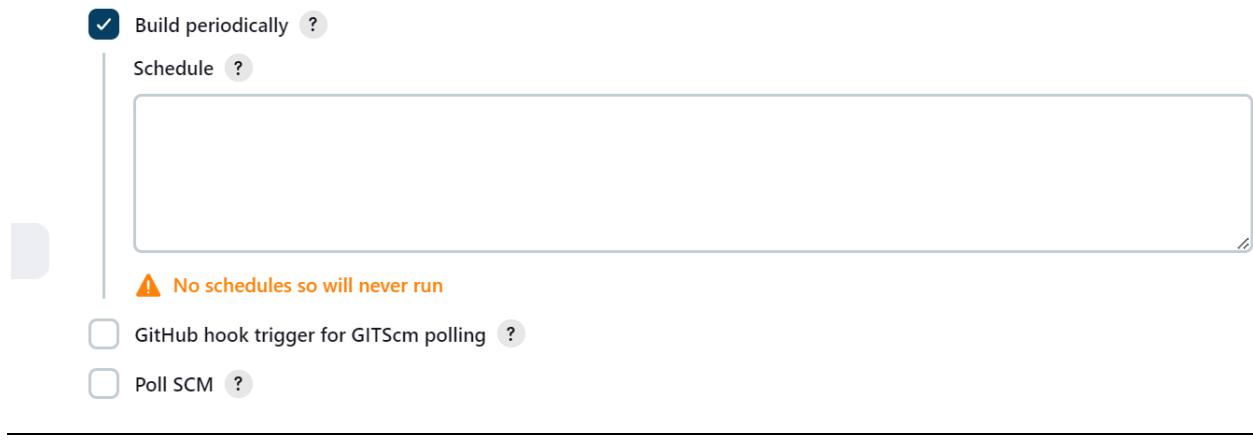
Trigger only if build is stable

Trigger even if the build is unstable

Trigger even if the build fails

Always trigger, even if the build is aborted

دي شبهه ال cronjob في ال Linux انه بتحددله وقت معين يتعمله run فيه بس هنا periodically-3 هيتعمل run للي pipeline كل



hook trigger-4 : هنا مثلا لو لما حد يعمل push علي ال repo ال GitHub يبعث زي فال pipeline دا يتعمله run والنوع دا مستخدم بكثرة

github poll scm-5 : زي ال cronjob لكن هنا بيعمل check هل في تغييرات حصلت ولاا في ال run لو حصلت اعمل run لـ pipeline



## Configure

### Build Environment

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Delete workspace before build starts

Use secret text(s) or file(s) ?

Add timestamps to the Console Output

Inspect build log for published build scans

Terminate a build if it's stuck

With Ant ?

في ال build environment في اكتر من حاجه

ـ1 : هنا كل مره بيعمل run لـ pipeline يحذف ال Folder ويعمله من اول وجديد

ـ2 : دا لو عاوز تحفظ لك credentials file : secret text

ـ3 : يعني ال build لو حصله stuck يتعمله terminate ولا يفضل شغال

### Build Steps

#### Execute shell ?

Command

See [the list of available environment variables](#)

```
ls
mkdir iti
cd iti
echo "hello Jenkins" > myfile
```

Advanced ▾

ـ4 : ال build steps دي الحاجات ال عاوز انفذها ( ال هي ال pipeline )

## Post-build Actions

### E-mail Notification ? X

**Recipients**  
Whitespace-separated list of recipient addresses. May reference build parameters like \$PARAM. E-mail will be sent when a build fails, becomes unstable or returns to stable.

mostafaamahmoud60@gmail.com

Send e-mail for every unstable build ?

Send separate e-mails to individuals who broke the build

Save Apply

بعد ال build مثلاً ممكن تخليه يبعث email notification على ال

Dashboard > All >

**Enter an item name**

pipeline » Required field

 **Freestyle project**  
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

 **Pipeline**  
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

 **Multi-configuration project**  
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

عمل النوع الثاني وهو ال Create Pipeline

Jenkins

Search (CTRL+K) Admin log out

Dashboard > pipeline > Configuration

**Configure**

**General**

Enabled

Description

Plain text [Preview](#)

Discard old builds ?

Do not allow concurrent builds

Do not allow the pipeline to resume if the controller restarts

GitHub project

Pipeline speed/durability override ?

Preserve stashes from completed builds ?

This project is parameterized ?

Throttle builds ?

**Build Triggers**

Build after other projects are built ?

Build periodically ?

GitHub Branches

GitHub Pull Requests ?

GitHub hook trigger for GITScm polling ?

Poll SCM ?

Quiet period ?

Trigger builds remotely (e.g., from scripts) ?

**Advanced Project Options**

Advanced

**Pipeline**

Definition

Pipeline script

Script ?

```
1 * pipeline {  
2     agent any  
3     stages {  
4         stage('Hello') {  
5             steps {  
6                 echo 'Hello World'  
7             }  
8         }  
9     }  
10 }  
11 }  
12 }
```

Use Groovy Sandbox ?

[Pipeline Syntax](#)

Dashboard > pipeline > Configuration

## Configure

- General
- Advanced Project Options
- Pipeline

Discard old builds ?

Strategy

Log Rotation

Days to keep builds  
if not empty, build records are only kept up to this number of days

Max # of builds to keep  
if not empty, only up to this number of build records are kept

Advanced ▾

discard old builds-1 : بتحدد عدد او أيام معينة يسبلك فيها ال old build ودي حاجه مفيدة لأنه لو فضل يسبب كل ال old build ع المدى البعيد هي عمل مشكله في ال storage مثلًا هتملي بسرعه لأنها فالآخر هي files بتترمي ع ال Jenkins

وممكن اختيار عدد أيام احتفظ بال build او احتفظ ب عدد build معين

## Configure

- General
- Abort previous builds ?

Do not allow concurrent builds

Do not allow concurrent builds : يعني ان مفيش 2 build يتعملهم run في نفس الوقت

- General
- Do not allow the pipeline to resume if the controller restarts

Do not allow the pipeline to resume if the controller restarts

: Do not allow the pipeline to resume if the controller restarts

هدلله مثلًا لو بيحصل build وحصل ريستايرت لما ال Jenkins يرجع يكمل build من مكان ما وقف ولا يرجع يعيد من الأول

- General
- Advanced Project Options
- Pipeline

GitHub project

Project url ?

Advanced ▾

دا URL الخاص بال Project بتاعي على ال Github

## Configure

General

Advanced Project Options

### Pipeline speed/durability override ?

Custom Pipeline Speed/Durability Level

Maximum durability but slowest (previously the only option)

Performance-optimized: much faster (requires clean shutdown to save running pipelines)

Less durability, a bit faster (specialty use only)

Maximum durability but slowest (previously the only option)

: Pipeline speed/durability override

بحددله انا مهم بالسرعة ولا الأداء الخاص بال Pipeline

---

### Preserve stashes from completed builds ?

Keep this many of the most recent builds' stashes ?

1

: Preserve stashes from completed builds

بقوله احفظلي عدد معين من ال Completed builds

---

: This project is parameterized

دا مثلًا قبل م تعمل run لل pipeline يكون فيه option بتختاره

A screenshot of a Jenkins pipeline configuration page. A dropdown menu is open, listing various parameter types: Boolean Parameter, Choice Parameter, Credentials Parameter, File Parameter, Multi-line String Parameter, Password Parameter, Run Parameter, and String Parameter. The 'String Parameter' option is selected, indicated by a checked checkbox icon. The dropdown also includes a 'Filter' input field and an 'Add Parameter' button.

Throttle builds ?

Number of builds ?

1

Approximately 60 minutes between builds

Time period ?

Second

Allow user triggered builds to skip the rate limit ?

: Throttle builds

هذا مثلًا بحدده انها خلال ساعة او وقت معين يقدر يعمل run كام مره



آخر حاجة بكتب ال Script الخاص بال Pipeline وبيكتب بلغة اسمها Groovy وهي لغة مخصوصة  
بال Jenkins

## Console Output

```
Started by user Admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/jenkins_home/workspace/pipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

ودا ال Output الخاص بال Pipeline

## Definition

Pipeline script from SCM

SCM ?

None

None

Git

Script Path .

Jenkinsfile

Lightweight checkout ?

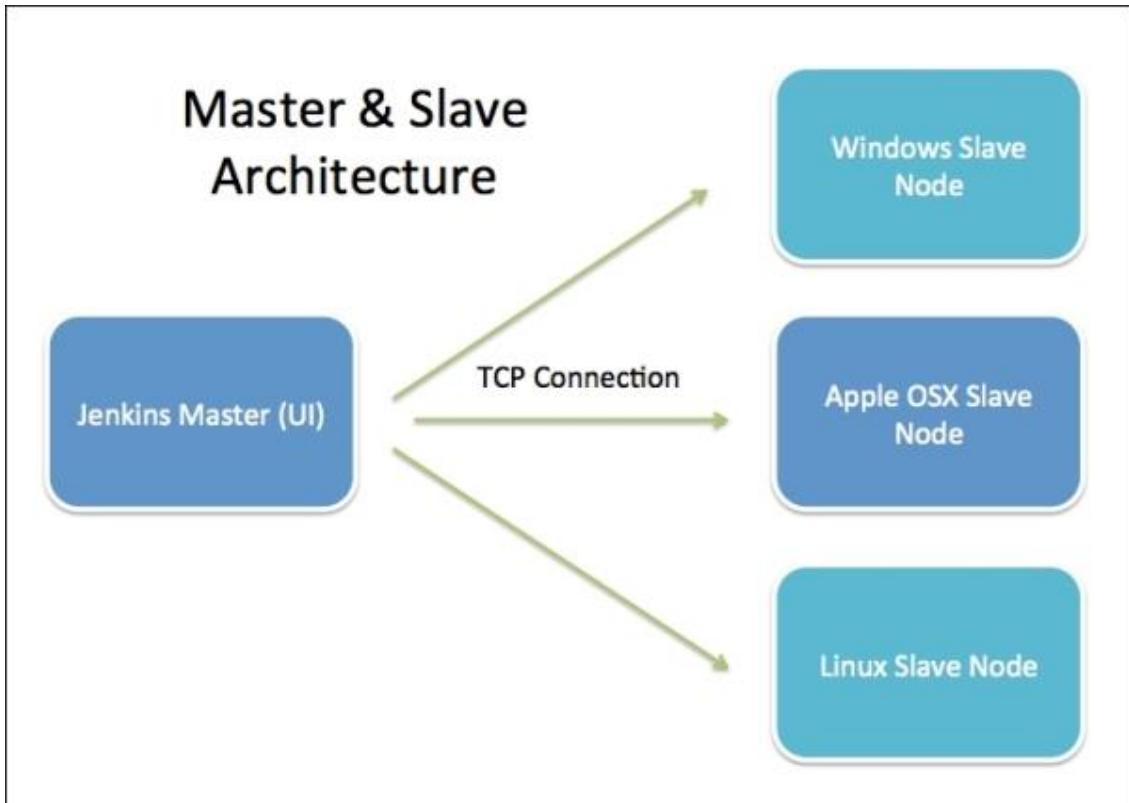
**Pipeline Syntax**

**Save**

Apply

دا النوع الثاني كتابه ال Pipeline : بقوله مش هعمل Script  
انا هجيب Jenkinsfile جهاز مكتوب فيه ال Script بتاعي من ال Git

## : Jenkins Architecture



يبكون عندي Jenkins Master ودي ال بعمل عليها ال Configuration الخاصة بال Jenkins Master

وبيكون عندي Agent ودا الي هعمل عليها ال Build

لازم يكون ال agent دا عليه :

1- JDK

2- Workspace Directory

3- Enable SSH

4- ال Master الخاص بال public Key

ال Jenkins عامله image علي ال Docker Hub مخصصه لل Agent وكل حاجه عليها جاهزة الا انك فقط هتضنع ال Public Key الخاص بال Master

طيب ازاي اجيبي ال Public Key بتاع ال Master ؟

```
[root@192 ~]# docker exec -it -u jenkins jenkins bash  
jenkins@0a21919beccc:$
```

1- هتدخل على ال Container

--

```
jenkins@0a21919beccc:$ ssh-keygen  
Generating public/private rsa key pair.  
Enter file in which to save the key (/var/jenkins_home/.ssh/id_rsa):  
Created directory '/var/jenkins_home/.ssh'.  
Enter passphrase (empty for no passphrase):  
Enter same passphrase again:  
Your identification has been saved in /var/jenkins_home/.ssh/id_rsa  
Your public key has been saved in /var/jenkins_home/.ssh/id_rsa.pub  
The key fingerprint is:  
SHA256:vohgLkBGYbIGJc3mcQted0dMPHJ9neVH0zu5JGYfpNw jenkins@0a21919beccc  
The key's randomart image is:  
+---[RSA 3072]---+  
|++o.. .o. . oo|  
|++* o..+= . . oo.|  
|o= = . oo. . +o|  
|.oo . . + |=  
|o S * E |  
|. . o + +|  
.o . o |  
| . . . . |  
+---[SHA256]---+
```

هتكتب ال Key الخاص بال Command هو ssh-keygen

--

```
[root@192 ~]# docker cp jenkins:/var/jenkins_home/.ssh/id_rsa.pub .  
Successfully copied 2.56kB to /root/.  
[root@192 ~]# ls  
anaconda-ks.cfg  Downloads  ngrok-v3-stable-linux-amd64.tgz  Templates  
Desktop          id_rsa.pub  Pictures                Videos  
Documents        Music      Public
```

بعد كذا انقل من ال Container للجهاز عادي بال docker cp

```
[root@192 ~]# docker run -d --name=agent --publish 2200:22 -e "JENKINS_AGENT_SSH_PUBKEY=$(cat id_rsa.pub)" jenkins/ssh-agent
Unable to find image 'jenkins/ssh-agent:latest' locally
latest: Pulling from jenkins/ssh-agent
fea1432adf09: Pull complete
a235bee2ae34: Pull complete
88736e9b2246: Pull complete
e3c311160846: Pull complete
4f4fb700ef54: Pull complete
6649848c81ad: Pull complete
bb9cc473595f: Pull complete
af03866356a6: Pull complete
Digest: sha256:2be1131e2f5df0d595b23550849fc4f57f6261f76166618c98c45ad573ab9178
Status: Downloaded newer image for jenkins/ssh-agent:latest
2290e5dace55e525b74d1e314266f6c4a149ac2358b2e87f44154c9b4a09cdde
```

واخير هتعمل Run لـ image الخاصه بال agent

The screenshot shows the Jenkins dashboard with the 'Nodes' section selected. The main table lists one node: 'Built-in Node' (Data obtained, 52 min). A blue button labeled '+ New Node' is visible in the top right. The left sidebar includes sections for 'Build Queue' (empty) and 'Build Executor Status' (0 of 2 executors busy).

هتفتح ال New Node وتدخل على Mange Jenkins ثم Master

The screenshot shows the 'New node' configuration page. The 'Node name' field is filled with 'agent-01'. The 'Type' section is set to 'Permanent Agent'. A detailed description explains that this adds a plain permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

هتكتب اسم لـ Agent وضغط Create

agent-01

Description ?

Plain text [Preview](#)

Number of executors ?

1

ال Number of executors هي هسمح لكام Build يحصل في نفس الوقت

Remote root directory ?

! Remote directory is mandatory

ال Remote root directory : ال Dir الخاص بال Workspace

طيب اجييه منين؟ ممكن تعمل docker Inspect لـ agent هتلacieh موجود

```
        "/var/run": {},
      },
      "WorkingDir": "/home/jenkins",
      "Entrypoint": [
        "setup-sshd"
      ],
      "Env": [
        "TERM=xterm"
      ]
    }
```

Remote root directory ?

/home/jenkins

Labels ?

agent-01

Usage ?

Only build jobs with label expressions matching this node

ال labels بميز ال agent دا

ال usage بقوله متعلمس Run على ال Agent غير لما ال Labels يساوي ال Label بتاع ال Agent دا

Launch method ?

Launch agents via SSH

Host ?

172.17.0.3

Credentials ?

jenkins

+ Add ▾

ال Launch Method دي الطريقه ال هعمل فيها Connect على ال Agent وهي ال SSH  
ال Host ودا ال IP الخاص بال Container بتاع ال Agent وممكن تعرفه عن طريق ال  
ال Credentials الخاصة بال Master key وهذا يتضمن ال Privet key

## Host Key Verification Strategy ?

Non verifying Verification Strategy

Advanced ▾

## Availability ?

Keep this agent online as much as possible

ال Verification لو عاوز تعمل Connect لما تعمل Verification

ال Availability هي ان ال Agent هيفضل متاح عطول ولا في وقت معين فقط

Dashboard > Nodes >

Nodes

+ New Node Configure Monitors

S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
agent-01	Linux (amd64)	In sync	62.65 GiB	3.92 GiB	62.65 GiB	774ms	↗
Built-In Node	Linux (amd64)	In sync	62.65 GiB	3.92 GiB	62.65 GiB	0ms	↗

Build Queue

No builds in the queue.

Build Executor Status

built-in node + 1 agent (0 of 2 executors busy)

Icon: S M L Legend

بعد متعمل Agent ظهر معك Save هتلaci

```
INFO: Both error and output logs will be printed to /home  
<===[JENKINS REMOTING CAPACITY]==>channel started  
Remoting version: 3206.vb_15dcf73f6a_9  
Launcher: SSHLauncher  
Communication Protocol: Standard in/out  
This is a Unix agent  
Agent successfully connected and online
```

لو دخلت عليه وفتحت ال Log هنلاقي انه عمل Connect لو الدنيا تمام

Build Executor Status

Node	Status
Built-In Node	1 Idle
agent-01	2 Idle

هنلاقيه ظهر في ال Build

Build Executor Status

Node	Status
agent-01	1 Idle

دخلت علي ال Master وخليت ال Number of executors بتساوي صفر  
فال Master مفهاش غير ال Agent Run هيحصل علي ال Build Executor Status

## Labels ?

agent-02

## Usage ?

Use this node as much as possible

ضفت Agent کمان بس ال Usage سبتها عادي انه يحصل عليه Build مش لازم احدد ال Label بتاعه

## Definition

Pipeline script

## Script ?

```
1 ▾ pipeline {  
2     agent any  
3  
4 ▾     stages {  
5     | stage('Hello') {  
6     | | steps {  
7     | | | echo 'Hello World'  
8     | | }  
9     | }  
10    }  
11 }  
12 }
```

وبالتالي في ال Script لو سبت ال Agent يكون Any فيه تعلمle Build على ال 02



## Console Output

```
Started by user Admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on agent-02 in /home/jenkins/workspace/pipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

## Definition

### Pipeline script

#### Script ?

```
1 ▾ pipeline {
2     agent {label 'agent-01'}
3
4 ▾     stages {
5         ▾ stage('Hello') {
6             ▾ steps {
7                 ▾ echo 'Hello World'
8             }
9         }
10    }
11 }
12
```

عشن اخليه يتعمله Run على ال Agent-01 بحدله ان ال Labels بتاعه اسمه agent-01

## ✓ Console Output

```
Started by user Admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on agent-01 in /home/jenkins/workspace/pipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

لما اجي اعمل build هيحصل علي ال Agent-01

---

طيب لحد كدا تمام ؟ لو جينا استخدمنا في ال Script اوامر خاصه بال Docker مش هيشتغل لأن ال معلهوش ال Docker وعشان اشغل عليه ال Agent

---

```
[root@192 ~]# mkdir jenkins-agent-with-docker
```

عمل Dir جديد

```
[root@192 ~]# cd jenkins-agent-with-docker
```

دخل في ال Dir

```
[root@192 jenkins-agent-with-docker]# vim Dockerfile
```

## هعمل Dockerfile

```
FROM jenkins/ssh-agent
RUN apt-get update -y
RUN apt-get install -y ca-certificates curl gnupg lsb-release
RUN curl -fsSLo /usr/share/keyrings/docker-archive-keyring.asc \
  https://download.docker.com/linux/debian/gpg
RUN echo "deb [arch=$(dpkg --print-architecture) \
  signed-by=/usr/share/keyrings/docker-archive-keyring.asc] \
  https://download.docker.com/linux/debian \
  $(lsb_release -cs) stable" > /etc/apt/sources.list.d/docker.list
RUN apt-get update && apt-get install -y docker-ce-cli
~
~
~
```

هكتب ال Code بتاعي وال هو عباره ال Agent عادي لكن بعمل install لـ docker كمان

```
[root@192 ~]# docker run -d --name=agent3 --publish 2400:22 -e "JENKINS_AGENT_SSH_PUBKEY=$(cat id_rsa.pub)" -v /var/run/docker.sock:/var/run/docker.sock agent
0285d1dd481b9cd345c9b337832adbf041e5618dd427541a76d9a62a37677da
```

بعد كدا واخر حاجه بعمل ال Comannd بتاعي عادي

لكن ملحوظة لازم تعمل Volume ال هو /var/run/docker.sock:/var/run/docker.sock

عشان تعرف تستخدم ال Jenkins Commands الخاصه بال Docker بال Script

## Script ?

```
1 * pipeline {
2     agent { label 'agent-docker' }
3     environment {
4         PATH = "/usr/bin:/usr/local/bin:$PATH"
5     }
6     stages {
7         stage('Test Docker') {
8             steps {
9                 sh 'docker --version'
10            }
11        }
12    }
13 }
14 }
```

في ال script بحد ال env بتاعتي

وعاوز انفذ ال docker –version Command دا

---

## Console Output

```
Started by user Admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on agent-03 in /home/jenkins/workspace/dockerpipeline
[Pipeline] {
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Test Docker)
[Pipeline] sh
+ docker --version
Docker version 27.0.3, build 7d4bcd8
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

---

فهتلaci انه تمام و عمل ال Command بتاعتي

رسالة معينة وهذا Slack Notification Plugins بتبعتلك Message Run لو ال Build اتعمل اتبعتنلي

طيب اعمله Config ازاي؟

## Plugins

- Updates
- Available plugins
- Installed plugins
- Advanced settings

### Download progress

#### Preparation

- Checking internet connectivity
- Checking update center connectivity
- Success

#### Slack Notification

#### Pending

Loading plugin extensions

#### Pending

→ [Go back to the top page](#)

(you can start using the installed plugins right away)

→  Restart Jenkins when installation is complete and no jobs are running

## عمل Install لـ Slack Notification واسمها Plugins

عمل Slack Account على ال

وبعد كدا عمل Workspace

وبعد كدا عمل Channel



Search

Documentation Tutor

## Your Apps

Build something amazing.

Use our APIs to build an app that makes people's working lives better. You can create an app that's just for your workspace or create a public Slack App to list in the App Directory, where anyone on Slack can discover it.

Create an App

بعد كدا هروح على [api.slack.com/apps](https://api.slack.com/apps)

وعمل Create App لـ

# Name app & choose workspace

X

App Name

Jenkins

Don't worry - you'll be able to change this later.

Pick a workspace to develop your app in:



DevOps-in-Arabic



Keep in mind that you can't change this app's workspace later. If you leave the workspace, you won't be able to manage any apps you've built for it. The workspace will control the app even if you leave the workspace.

[Sign into a different workspace](#)

By creating a [Web API Application](#), you agree to the [Slack API Terms of Service](#).

Cancel

Create App

اعمل اسم لـ App وبختار ال Workspace ال عملتها create

## Incoming Webhooks

Post messages from external sources into Slack.

## Interactive Components

Add components like buttons and select menus to your app's interface, and create an interactive experience for users.

## Slash Commands

Allow users to perform app actions by typing commands in Slack.

## Bots

Allow users to interact with your app through channels and conversations.



## Event Subscriptions

Make it easy for your app to respond to activity in Slack.

## Permissions

Configure permissions to allow your app to interact with the Slack API.

هدا ادي ال App دا Permissions

## Scopes

A Slack app's capabilities and permissions are governed by the [scopes](#) it requests.

### Bot Token Scopes

Scopes that govern what your app can access.

OAuth Scope	Description ↓	
chat:write	Send messages as Jenkins	
users:read.email	View email addresses of people in a workspace	
users:read	View people in a workspace	

[Add an OAuth Scope](#)

ال Permission ب تكون في ال Scops و ضيف ال محتاجه من ال Permissions

**Features**

- App Home
- Org Level Apps
- Incoming Webhooks
- Interactivity & Shortcuts
- Slash Commands
- Workflow Steps
- OAuth & Permissions**
- Event Subscriptions
- User ID Translation
- App Manifest
- Beta Features

**Submit to App**

opted into token rotation

**Opt In**

---

### OAuth Tokens for Your Workspace

These OAuth Tokens will be automatically generated when you finish connecting the app to your workspace. You'll use these tokens to authenticate your app.

**Install to Workspace**

بعد كدا بتعمل Install لـ App دا ال Workspace



## Jenkins is requesting permission to access the DevOps-in-Arabic Slack workspace

### What will Jenkins be able to view?

- Content and info about your workspace

### What will Jenkins be able to do?

- Perform actions in channels & conversations

Cancel

Allow

تعمل Allow

# OAuth Tokens for Your Workspace

These tokens were automatically generated when you installed the Slack plugin. You can use these to authenticate your app. [Learn more.](#)

## Bot User OAuth Token

xoxb-7384110077810-7384177063298-evFo0Anf9TkkFYRpcaFs

Access Level: Workspace

[Reinstall to Workspace](#)

هيلعلك ال Tokens دا ودا ال هتخدو وتضعه في ال Jenkins

Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >

Secret text

Scope ?

Global (Jenkins, nodes, items, all child items, etc)

Secret

.....

ID ?

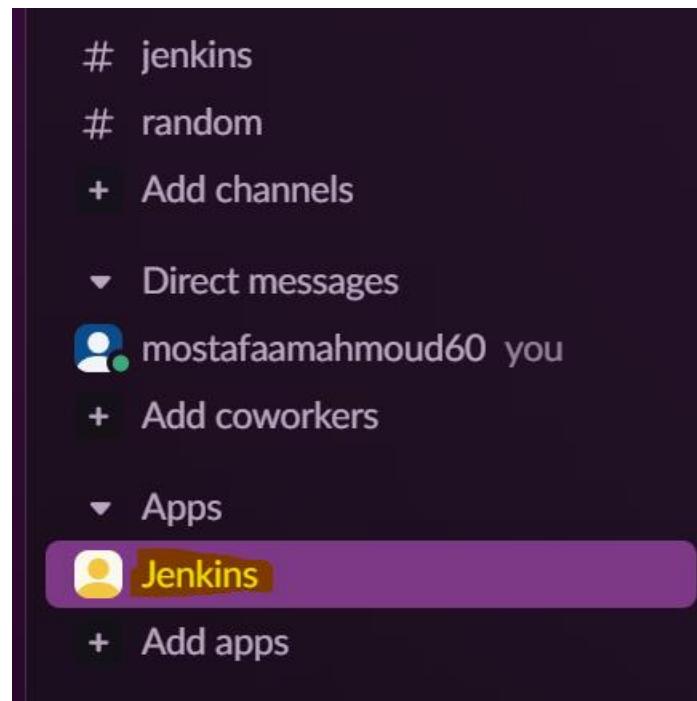
slack

Description ?

.....

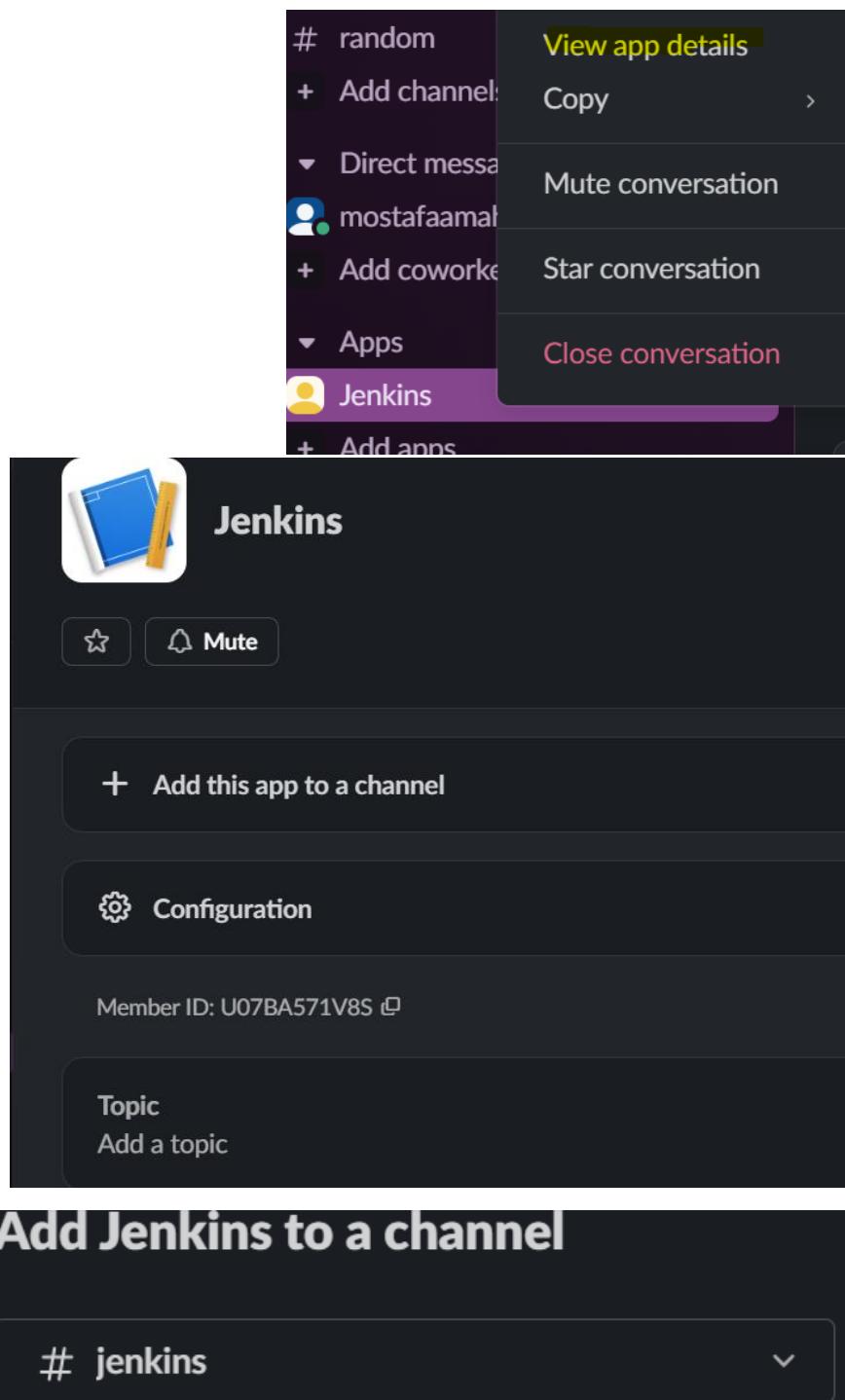
[Create](#)

هتروح علي ال Jenkins وتصيف Credentials و بتكون من نوع Secret



تناكد ان ال App ال عملته مضاف داخل ال Channel

---



ف العاده مش بيكون مضافق ف انت بتضييفه و تتأكد

## Slack

Workspace ?

DevOps-in-Arabic

Credential ?

slack

+ Add ▾

Default channel / member id ?

#jenkins

Custom slack app bot user ?

Advanced ▾

Save

Apply

آخر خطوه هي ال Config بتاع ال Slack على ال Jenkins من Manage Jenkins هتدخل علي System Section خاص بال Slack تبدا تضييف ال Config

ال Workspace هي اسم ال Slack على ال Workspace  
ال Tokens هي ال App على ال Credential  
ال Channel هي ال Slack على ال Channel ولازم يكون قبلها ال #

+ Add ▾

Default channel / member id ?

#jenkins

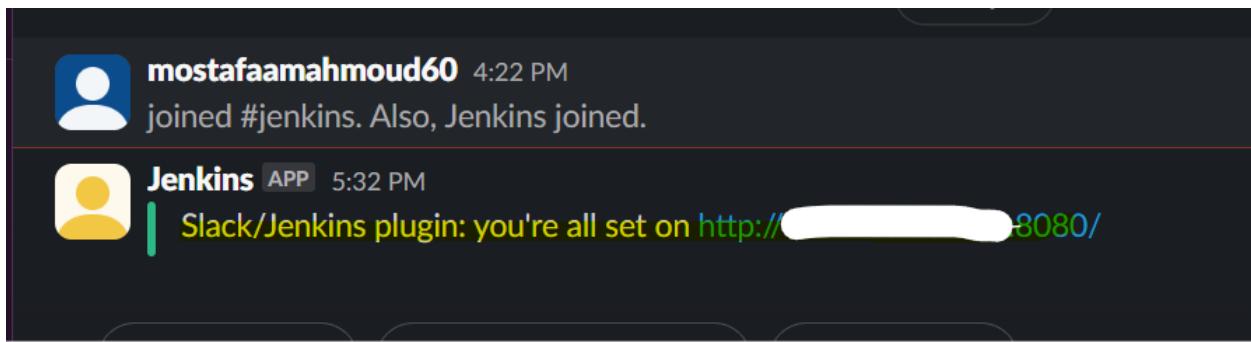
Custom slack app bot user ?

Advanced ▾

Success

Test Connection

لو عملت Success وال Config مظبوطه هيجبك Test connection



بعد م تعمل Save لو روحت علي ال Slack هتلaci في message انك جاهز تستقبل

طيب كدا دي ال Config ازاي ابدا استخدمنها ؟

---

### Script ?

```
1 ▾ pipeline {
2     agent any
3
4 ▾   stages {
5     ▾       stage('Hello') {
6         ▾           steps {
7             ▾               echo 'Hello World'
8
9             ▾           post {
10                ▾                   success {
11                    ▾                       slackSend color: "good", message: "Hello Jenkins"
12
13                }
14            }
15        }
16    }
17 }
```

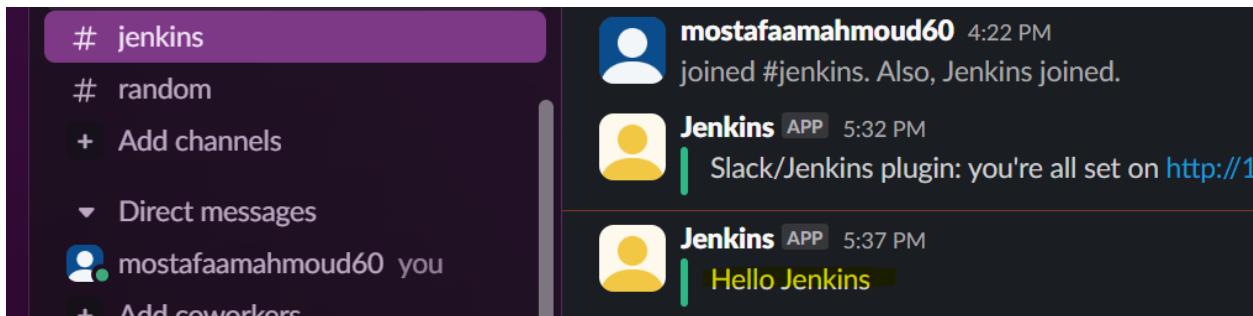
بالطريقه دي فال Script بقوله لو ال Build كان Success ابعتلي message علي ال Slack تقولي فيها Hello Jenkins

---

## Console Output

```
Started by user Admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on agent-02 in /home/jenkins/workspace/pipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
Post stage
[Pipeline] slackSend
Slack Send Pipeline step running, values are - baseUrl: <empty>, teamDomain: DevOps-in-Arabi
color: good, botUser: true, tokenCredentialId: slack, notifyCommitters: false, iconEmoji: <e
<empty>, timestamp: <empty>
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

لما تعمل Run ويكون Success في ال Logs هيقولك انه بعتلك ال message على ال Slack



ولو روحت على ال Slack هتلقي ال message ال كتبناها في ال Pipeline Script

By: Mostafa Mahmoud Bahgat

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