cprime

How to Integrate Jenkins with GitHub

Jenkins has become one of the most popular tools to create CI/CD pipelines. There are many reasons for this, and one is the number of plugins and integrations that allow users to work with almost any tool or platform out there. When you use a plugin, you only have to set some parameters like credentials. For instance, you could use a plugin to deploy your infrastructure to AWS or Azure. Or, you could use the GitHub plugin to use Git as a repository for application or infrastructure code—you've come here for this, I know.

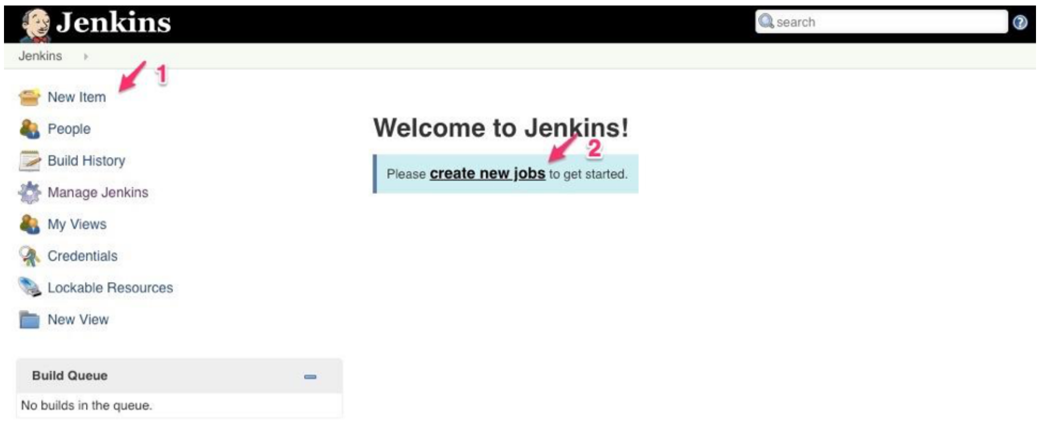
Git is an essential plugin that everyone working with Jenkins will need. You can get to the point of configuring a Jenkins job only once. Then, all subsequent changes for the delivery pipeline can be done using a version control system like Git. Are you wondering how to do this? You've come to the correct place; I'll show you how to integrate Jenkins with GitHub step by step.

Let's get started!

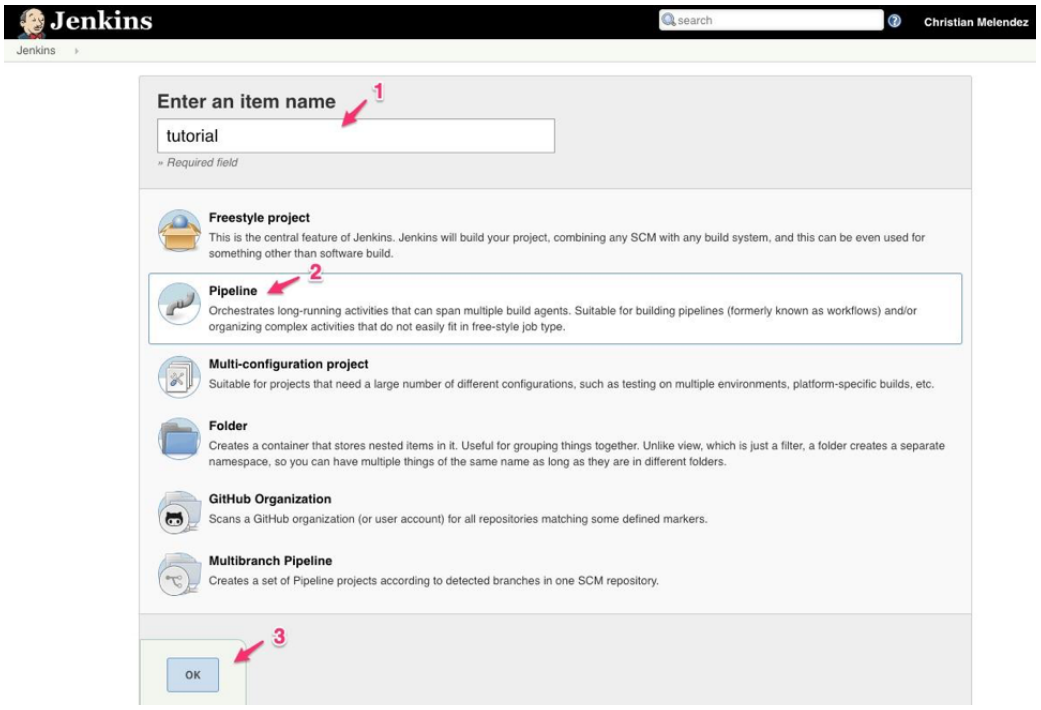
A necessary prerequisite is to have a server with Jenkins up and running with the GitHub plugin. It's there if you installed the suggested plugins, but if you want to start from scratch, installing Jenkins isn't complicated. You need to have Java 8 or 11 before you start. You'll find more details in Jenkins docs about what it takes to install Jenkins in different platforms, like Linux or Windows. AWS or Azure marketplace have an option to instantiate a VM with Jenkins preinstalled. So, you have several options. Make sure you can log in with admin credentials to Jenkins and move on to the next section.

Create a Jenkins Job

You now need to create a Jenkins job. To do so, click **New Item** (1). Or, if it's a clean install, click on **create new jobs** (2). Below is a screenshot of what it should look like:



On the following screen, type a name for the job—for example, **tutorial** (1). Then, pick **Pipeline** (2) because we'll create a job where the instructions are defined in a Jenkinsfile hosted in a GitHub is going to be defined as code in the Jenkinsfile. To finish, click **OK** (3).



This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

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.

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

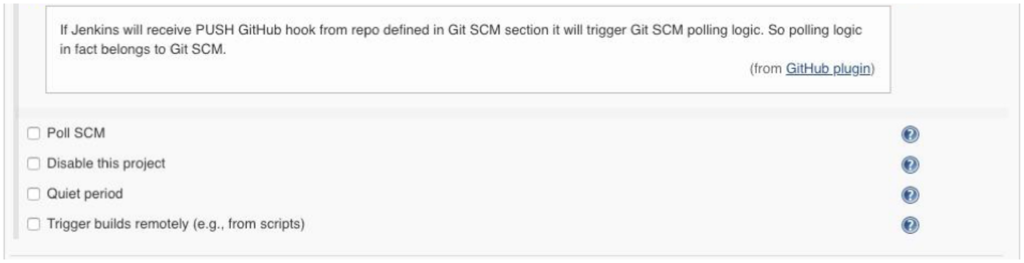
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

Scans a GitHub organization (or user account) for all repositories matching some defined markers.

Creates a set of Pipeline projects according to detected branches in one SCM repository.

Configure the GitHub Hook Trigger

In the screen you see now, scroll down a little to the **Build Triggers** section. We're going to make sure that this Jenkins job runs only when someone pushes a change in the GitHub repo. You can configure other actions, like when someone creates a pull request. But for simplicity's sake, we'll stick with the **push** action only. Of course, you can always run the job manually, but that's not ideal. So, choose the **GitHub hook trigger for GITScm polling** option.

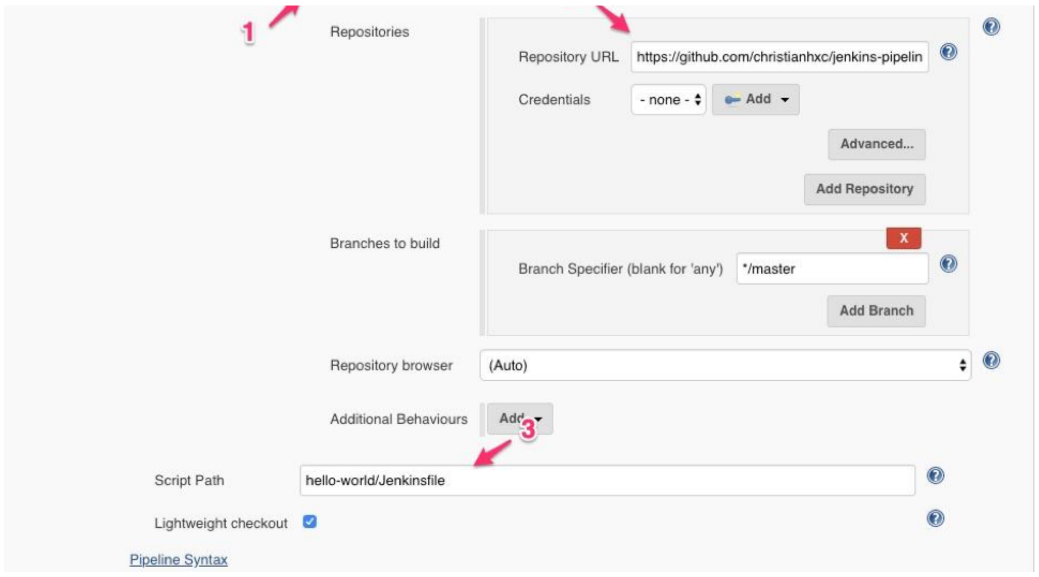

If Jenkins will receive PUSH GitHub hook from repo defined in Git SCM section it will trigger Git SCM polling logic. So polling logic in fact belongs to Git SCM.

(from GitHub plugin)

☐ Poll SCM
☐ Disable this project
☐ Quiet period
☐ Trigger builds remotely (e.g., from scripts)

Use a GitHub Repository

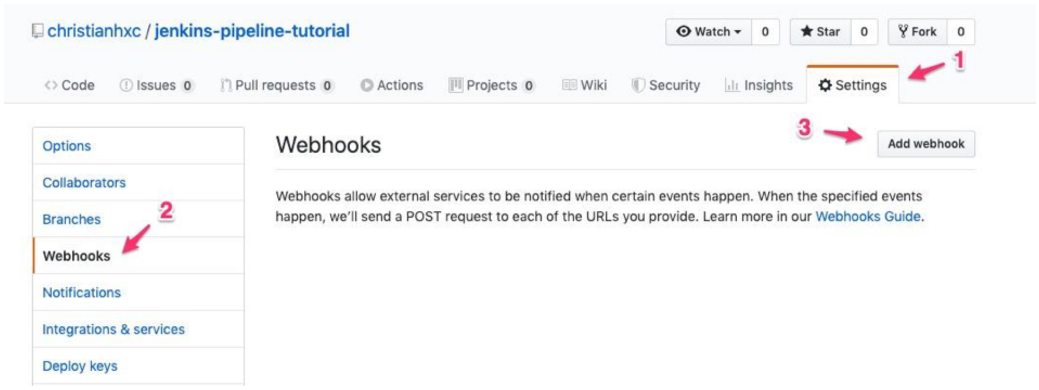
Scroll down a bit more and you'll see the **Pipeline** section, where we'll tell Jenkins to use the GitHub repo as the source. In the **Definition** dropdown, choose **Pipeline script from SCM** to configure the repo. For the **SCM** dropdown, pick **Git** (1), and below, in the **Repository URL**, type (or paste) the full GitHub repo URL. In my case, the URL of my repo is **https://github.com/christianhxc/jenkins-pipeline-tutorial.git** (2) —you'll have to use your own. You'll do a change later in the repo to test that the integration with GitHub works. Now, type the **Script Path**, which is going to be the path of the Jenkinsfile. In my case, the path is **hello-world/Jenkinsfile** (3). You can make a fork of my repo if you want to follow the same steps in this tutorial.


1
Repositories
Repository URL https://github.com/christianhxc/jenkins-pipelin
Credentials - none - Add
Advanced...
Add Repository
Branches to build
Branch Specifier (blank for 'any') */master
Add Branch
Repository browser (Auto)
Additional Behaviours Add
3
Script Path hello-world/Jenkinsfile
Lightweight checkout
Pipeline Syntax

Finally, click on the **Save** button that appears at the bottom of the screen.

Add a Webhook in GitHub

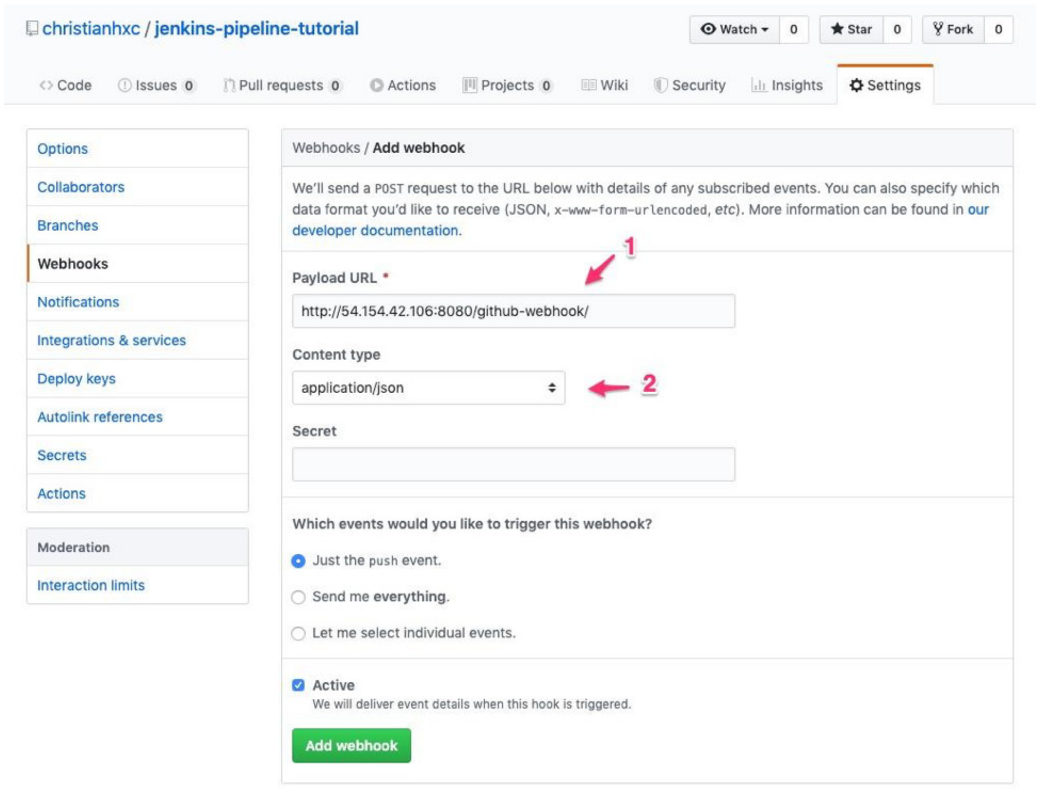
Now, go to the GitHub project because it's time to configure the webhook so that GitHub can trigger the Jenkins job after every push in the repo. In your project, click on the **Settings** (1) tab, then click **Webhooks** (2) from the left panel. Now, click on the **Add webhook** (3) button at the right. Here's a screenshot for reference:


christianhxc / jenkins-pipeline-tutorial
Watch 0 Star 0 Fork 0
Code Issues 0 Pull requests 0 Actions Projects 0 Wiki Security Insights Settings
1
Options
Collaborators
Branches
2
Webhooks
Notifications
Integrations & services
Deploy keys
3
Add webhook

Webhooks

Webhooks allow external services to be notified when certain events happen. When the specified events happen, we'll send a POST request to each of the URLs you provide. Learn more in our Webhooks Guide.

server. The Jenkins endpoint you'll use must be publicly available over the internet. In my case, the Jenkins URL is **http://54.154.42.106:8080/**, and I need to add **github-webhook/** at the end. So, the **Payload URL** in my case is **http://54.154.42.106:8080/github-webhook/** (1). Next, for the **Content type** dropdown, pick **application/json** (2). Leave the rest of the options as they are, with the **Just the push event** option selected. For simplicity, I said before that GitHub would call Jenkins only when there's a push in the repo. If you want to configure other actions, you'll have to select **Let me select individual events**, but for now, let's keep it simple. Finally, click on the green **Add webhook** button.



Webhooks / Add webhook

We'll send a POST request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, x-www-form-urlencoded, etc). More information can be found in our developer documentation.

Payload URL *: http://54.154.42.106:8080/github-webhook/

Content type: application/json

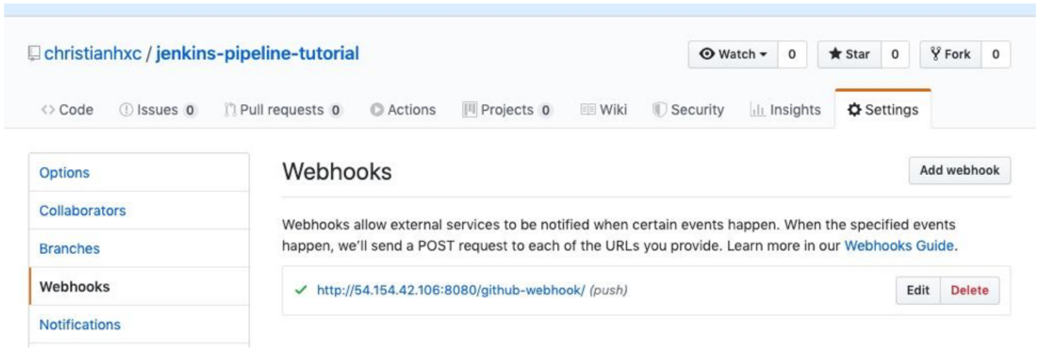
Secret:

Which events would you like to trigger this webhook?

[✓ Just the push event.]
Send me everything.
Let me select individual events.

[✓ Active]
We will deliver event details when this hook is triggered.

If the webhook works, you'll see a notification at the top saying that the hook was successfully created, as in the screenshot

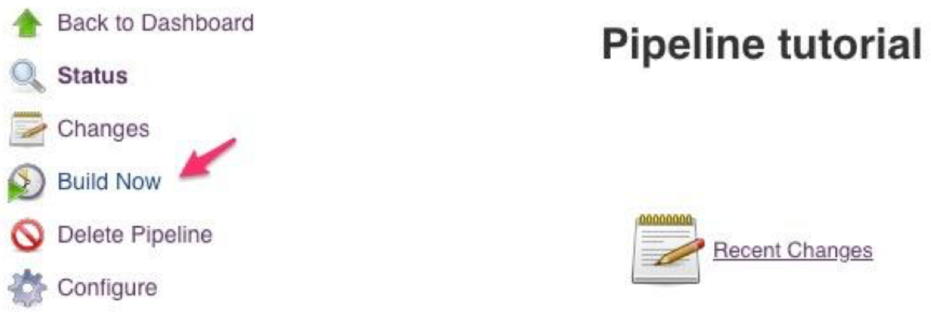

christianhxc / jenkins-pipeline-tutorial
Watch 0 Star 0 Fork 0
Code Issues 0 Pull requests 0 Actions Projects 0 Wiki Security Insights Settings
Options
Collaborators
Branches
Webhooks
Notifications
Webhooks
Add webhook
Edit
Delete

Webhooks allow external services to be notified when certain events happen. When the specified events happen, we'll send a POST request to each of the URLs you provide. Learn more in our Webhooks Guide.

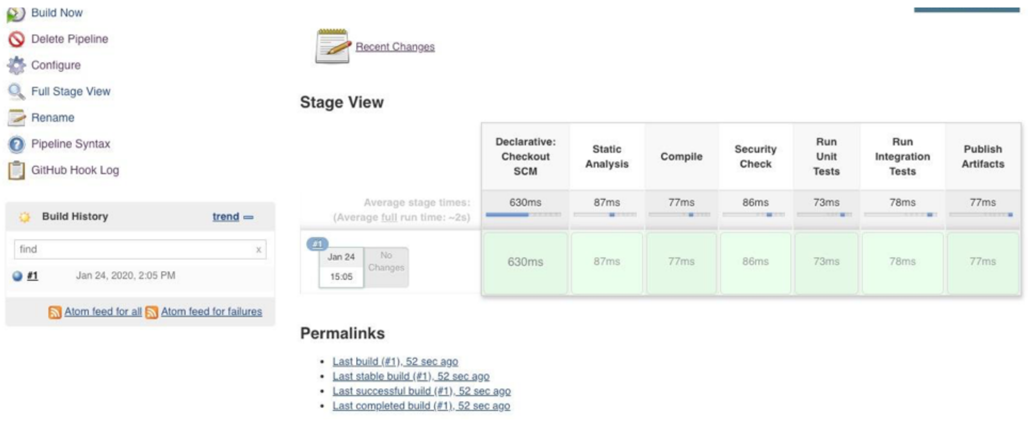
✓ http://54.154.42.106:8080/github-webhook/ (push)

Build the Jenkins Job Manually

Now go back to Jenkins, because we need to warm up the integration. To do so, click on the **Build Now** link from the left panel, and the Jenkins job will start running. This is a way of saying to Jenkins, “Hey, this job has the GitHub trigger option configured.” So, even if this step doesn’t make sense, do it, because I spent a few minutes figuring out why the integration with GitHub wasn’t working.



You should see a successful run of the job, like this:



Build Now
Delete Pipeline
Configure
Full Stage View
Rename
Pipeline Syntax
GitHub Hook Log

Build History trend
find
#1 Jan 24, 2020, 2:05 PM
Atom feed for all Atom feed for failures

Recent Changes

Stage View

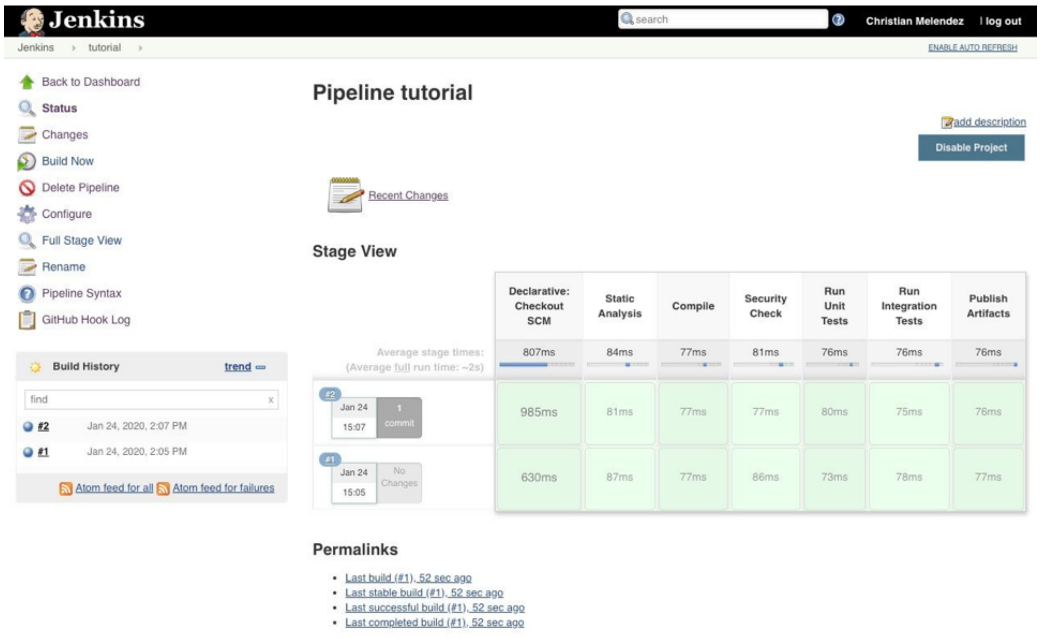
	Declarative: Checkout SCM	Static Analysis	Compile	Security Check	Run Unit Tests	Run Integration Tests	Publish Artifacts
Average stage times: (Average full run time: ~2s)	630ms	87ms	77ms	86ms	73ms	78ms	77ms
#1 Jan 24 15:05 No Changes	630ms	87ms	77ms	86ms	73ms	78ms	77ms

Permalinks

- Last build (#1), 52 sec ago
- Last stable build (#1), 52 sec ago
- Last successful build (#1), 52 sec ago
- Last completed build (#1), 52 sec ago

Change Something in the GitHub Repo

You finished the integration with GitHub in the previous step. But because you and I are good citizens, let's make sure that this integration works fully. So, go to the GitHub repository and change something, commit, and push. In my case, I added a new stage in the Jenkins pipeline to include more tests. Wait for a few seconds, and you should see another successful run of the job.



Jenkins search Christian Melendez | log out
Jenkins › tutorial › ENABLE AUTO REFRESH

Back to Dashboard
Status
Changes
Build Now
Delete Pipeline
Configure
Full Stage View
Rename
Pipeline Syntax
GitHub Hook Log

Build History trend
find
#2 Jan 24, 2020, 2:07 PM
#1 Jan 24, 2020, 2:05 PM
Atom feed for all Atom feed for failures

Pipeline tutorial

add description
Disable Project

Recent Changes

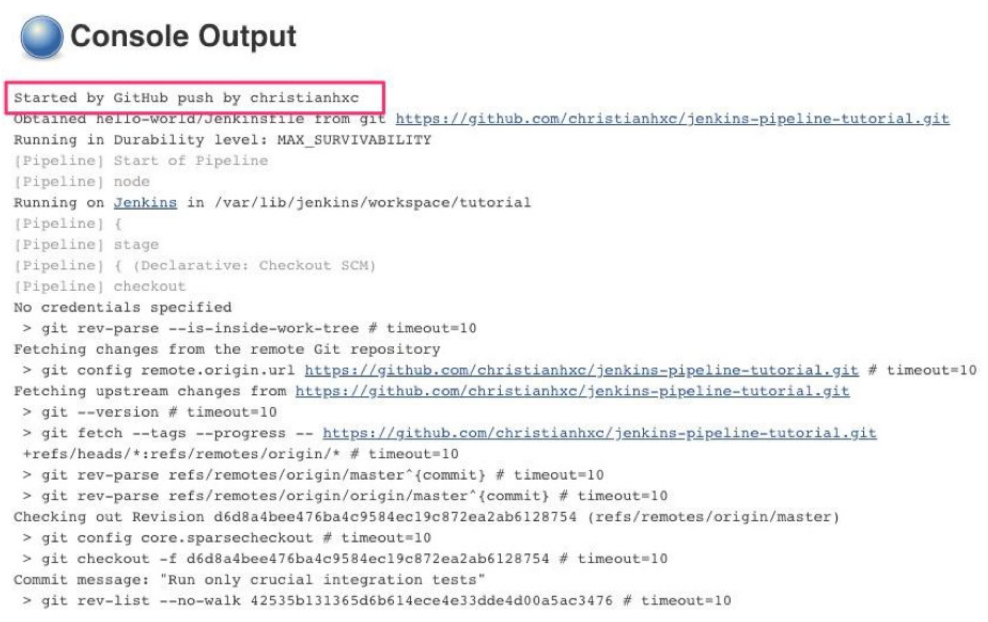
Stage View

	Declarative: Checkout SCM	Static Analysis	Compile	Security Check	Run Unit Tests	Run Integration Tests	Publish Artifacts
Average stage times: (Average full run time: ~2s)	807ms	84ms	77ms	81ms	76ms	76ms	76ms
#2 Jan 24 15:07 1 commit	985ms	81ms	77ms	77ms	80ms	75ms	76ms
#1 Jan 24 15:05 No Changes	630ms	87ms	77ms	86ms	73ms	78ms	77ms

Permalinks

- Last build (#1), 52 sec ago
- Last stable build (#1), 52 sec ago
- Last successful build (#1), 52 sec ago
- Last completed build (#1), 52 sec ago

something different at the beginning of the logs saying that GitHub started it, along with the username:



Console Output

```
Started by GitHub push by christianhxc
Obtained hello-world/Jenkinsfile from git https://github.com/christianhxc/jenkins-pipeline-tutorial.git
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/tutorial
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
No credentials specified
 > git rev-parse --is-inside-work-tree # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url https://github.com/christianhxc/jenkins-pipeline-tutorial.git # timeout=10
Fetching upstream changes from https://github.com/christianhxc/jenkins-pipeline-tutorial.git
 > git --version # timeout=10
 > git fetch --tags --progress -- https://github.com/christianhxc/jenkins-pipeline-tutorial.git
 +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git rev-parse refs/remotes/origin/master^{commit} # timeout=10
 > git rev-parse refs/remotes/origin/origin/master^{commit} # timeout=10
Checking out Revision d6d8a4bee476ba4c9584ec19c872ea2ab6128754 (refs/remotes/origin/master)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f d6d8a4bee476ba4c9584ec19c872ea2ab6128754 # timeout=10
Commit message: "Run only crucial integration tests"
 > git rev-list --no-walk 42535b131365d6b614ece4e33dde4d00a5ac3476 # timeout=10
```

And that's it—that's how you integrate Jenkins with GitHub. Every time someone pushes a change in the repo, this Jenkins job will run.

GitHub Integrates Pretty Well With Jenkins

When you configure your CI/CD pipelines in the way we did in this tutorial, the team is more productive. There will be a time where the team will forget about Jenkins. Every new step, update, or cleanup will be done in the Jenkinsfile. We configured the job where the flow will be like this: Developers change code, GitHub triggers the Jenkins job, and Jenkins executes all the steps needed to deploy the new change.