ATTACK DEFENSE

by PentesterAcademy

Name	Nginx Software
URL	https://www.attackdefense.com/challengedetails?cid=2041
Type	DevOps Basics: Continuous Integration

Important Note: This document illustrates all the important steps required to complete this lab. This is by no means a comprehensive step-by-step solution for this exercise. This is only provided as a reference to various commands needed to complete this exercise and for your further research on this topic. Also, note that the IP addresses and domain names might be different in your lab.

Challenge Description

The continuous Integration development process dictates that developers push the code into the master development repository frequently and each (or a small number of) code pushes can trigger the automated build, tests, and deploy the latest build on the test server.

Jenkins is an open-source automation server that is used widely for continuous integration.

A Jenkins instance and a Gitlab instance are provided to the user. The source code of Nginx is stored on the Gitlab instance.

Objective: Create a Jenkins job to configure and build the Nginx binary!

Instructions:

- The GitLab server is reachable with the name 'gitlab'
- Gitlab credentials:

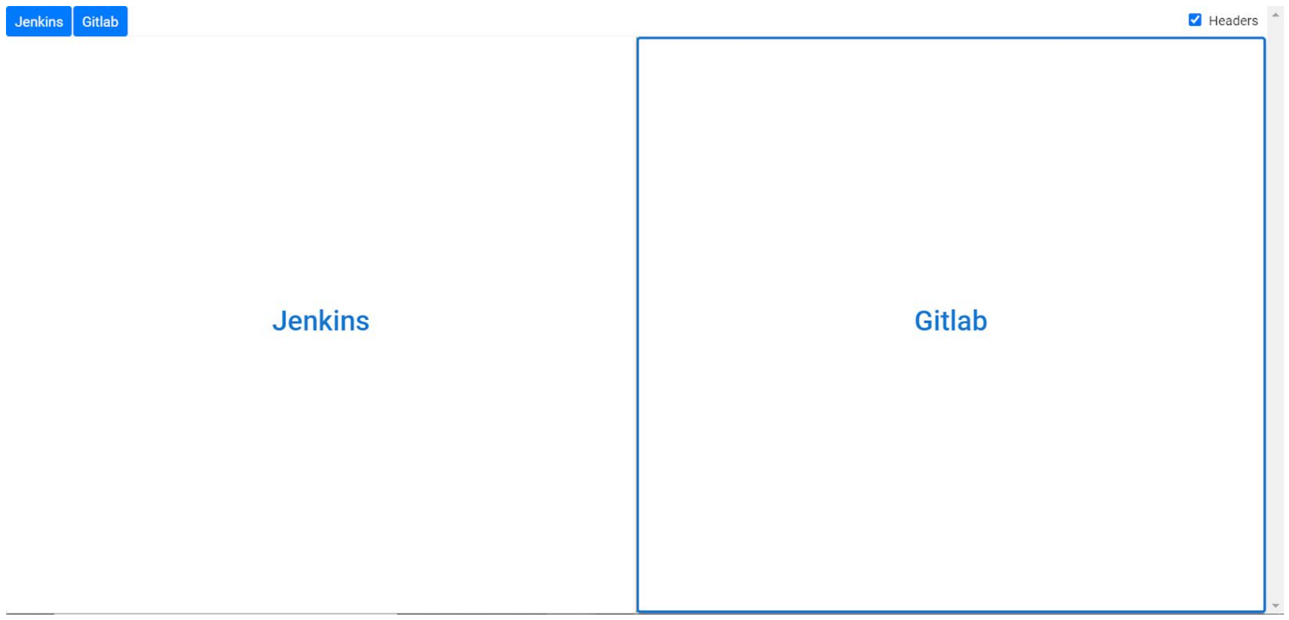
Username	Password
root	welcome123

- The Jenkins server is reachable with the name 'jenkins'
- Jenkins credentials:

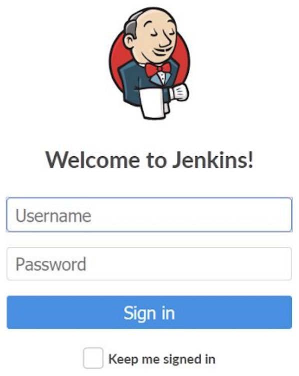
Username	Password
admin	welcome123

Lab Setup

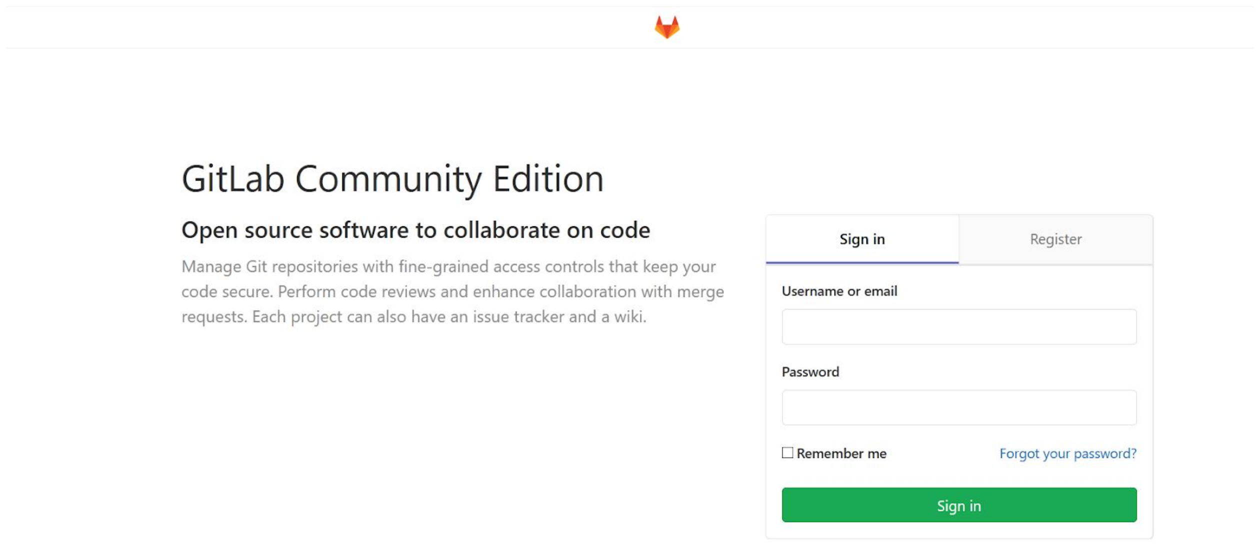
On starting the lab, the following interface will be accessible to the user.



On choosing (clicking the text in the center) left left panel, **Jenkins web UI** will open in a new tab



On selecting the right panel, a web UI of **Gitlab** will open in a new tab.



GitLab Community Edition

Open source software to collaborate on code

Manage Git repositories with fine-grained access controls that keep your code secure. Perform code reviews and enhance collaboration with merge requests. Each project can also have an issue tracker and a wiki.

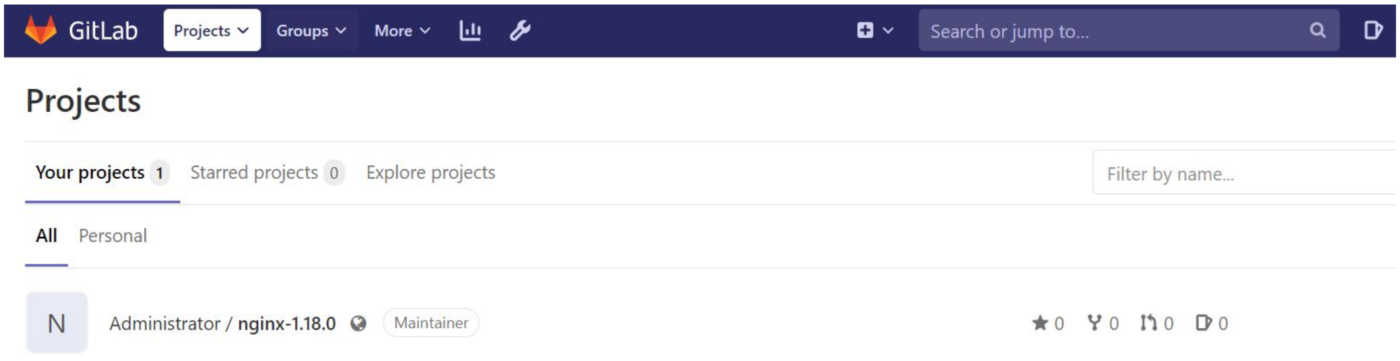
The GitLab instance takes time to function properly. Hence, for some time the following wait page might be visible. This page reloads automatically.

PENTESTER
ACADEMY
WebApp will appear once deployed!
This page refreshes automcatically.

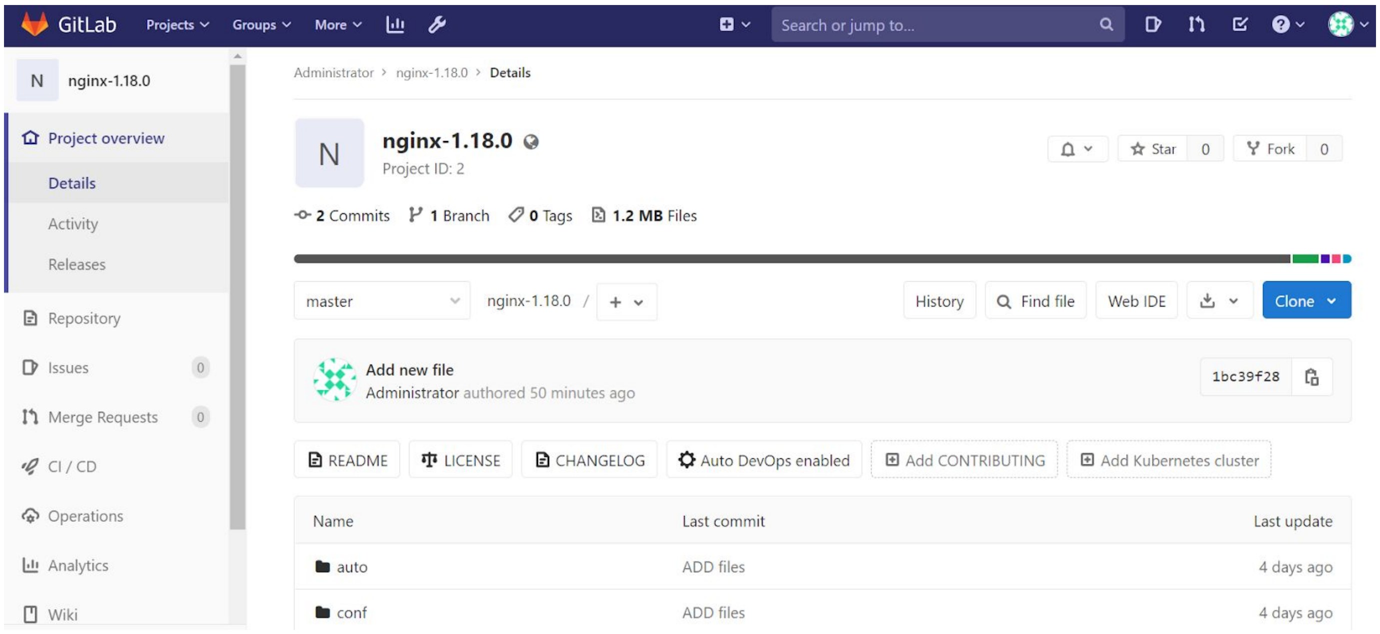
Solution

Step 1: Login into GitLab instance using the provided credentials:

Username: root
Password: welcome123



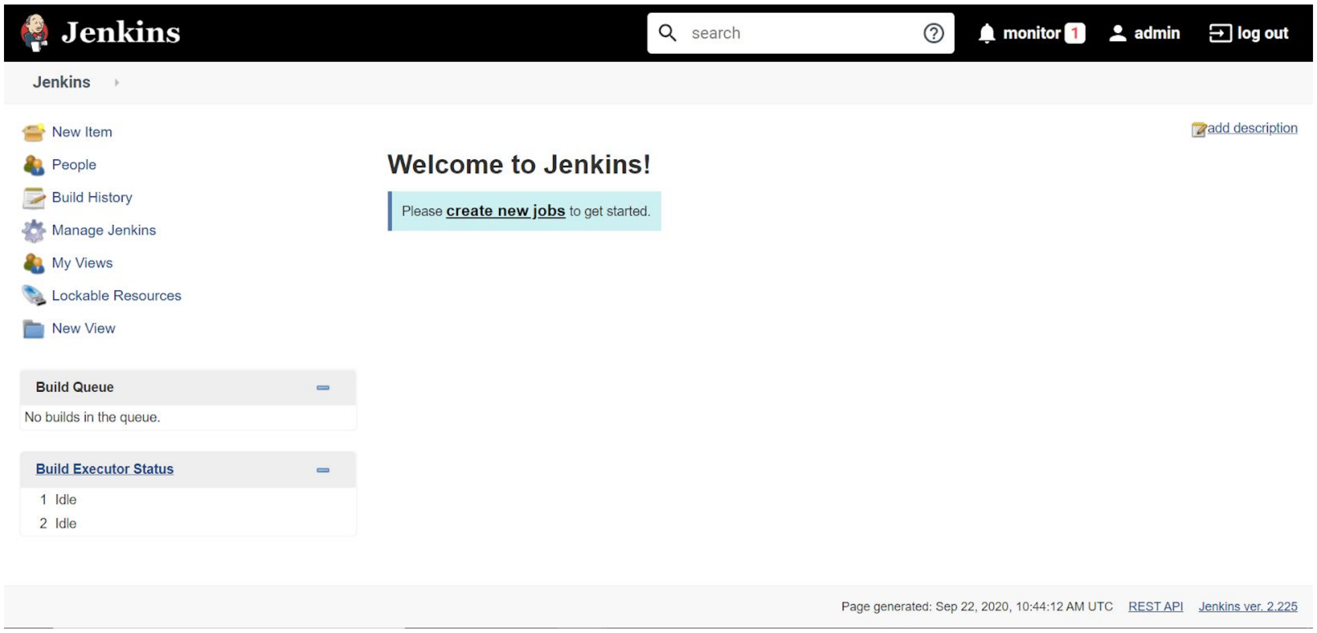
There is a repository present in the Administrator's account. Click on the repository link to open the repository page.



Name	Last commit	Last update
auto	ADD files	4 days ago
conf	ADD files	4 days ago

Step 2: Login into Jenkins instance using the provided credentials:

Username: admin
Password: welcome123



Welcome to Jenkins!

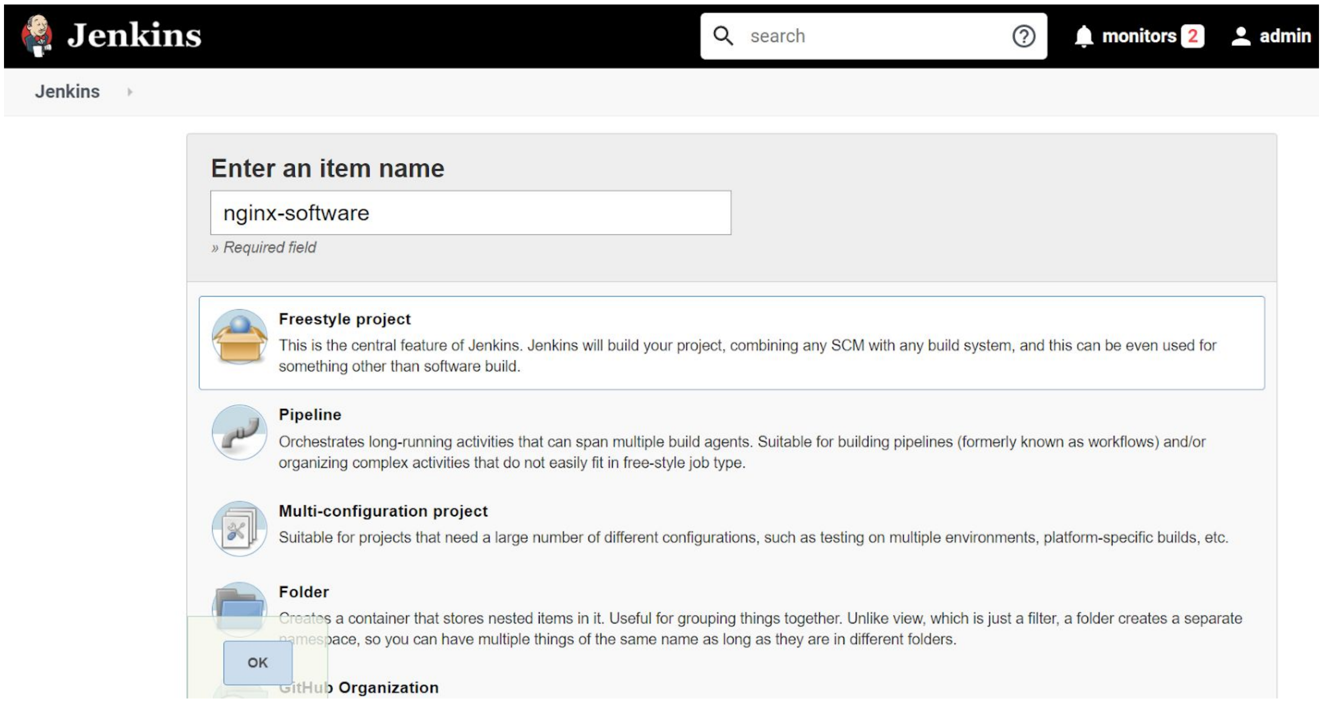
Please **create new jobs** to get started.

Page generated: Sep 22, 2020, 10:44:12 AM UTC REST API Jenkins ver. 2.225

There is no job in this Jenkins server.

Step 3: Click on the “create new jobs” link. A job creation wizard will run. Enter the name of the job on the first page. You are free to select any name you like. We are using “nginx-software”.

Then select the “Freestyle project” option and click the “OK” button.



Enter an item name

nginx-software

» Required field

Freestyle project
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.

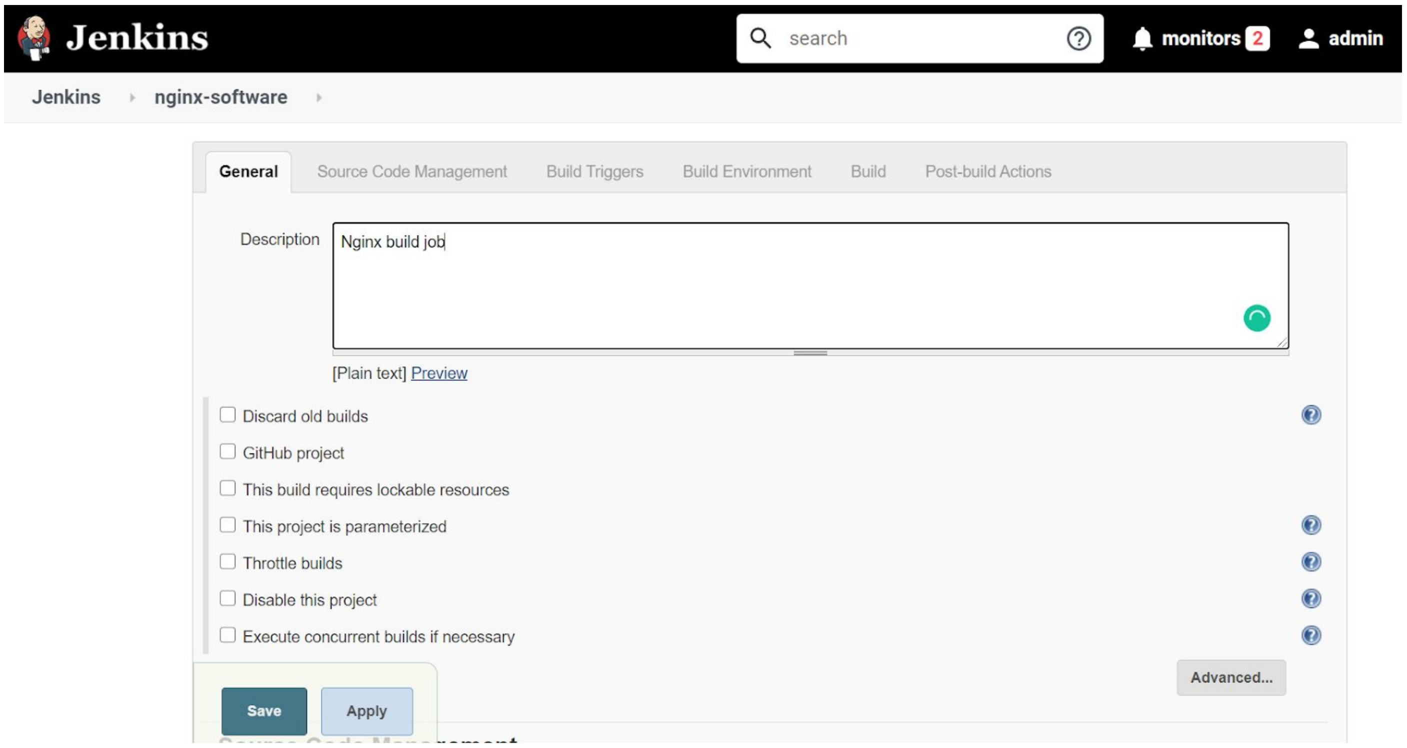
Pipeline
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

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

Folder
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.

GitHub Organization

On the next page, enter some description of the job.

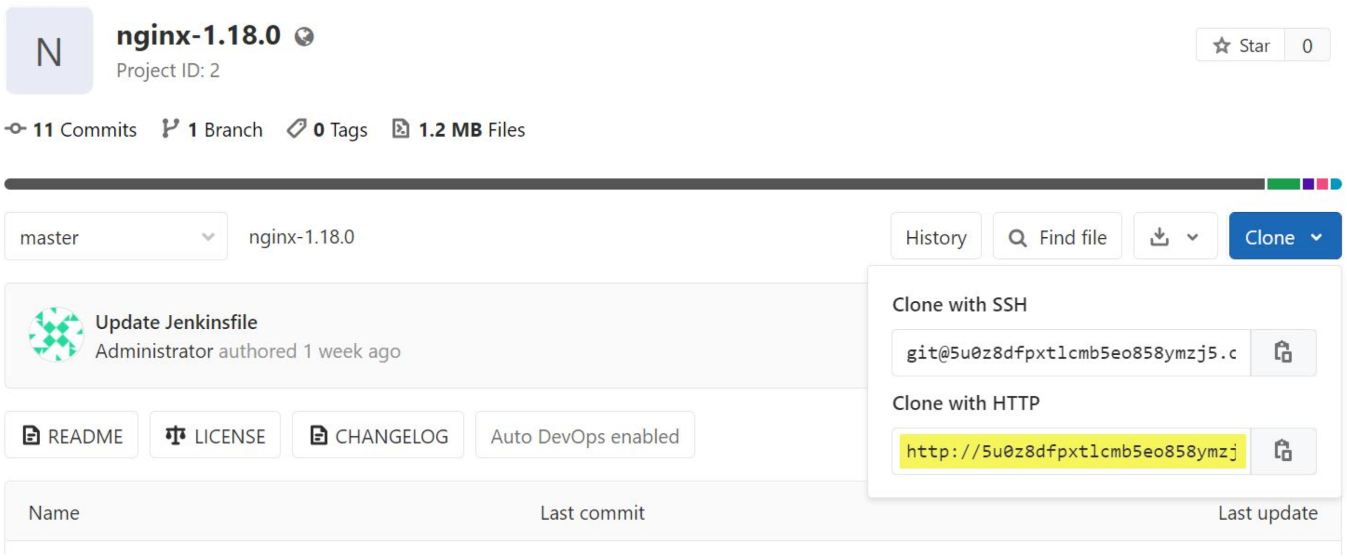


Description: Nginx build job

[Plain text] Preview

- [ ] Discard old builds
- [ ] GitHub project
- [ ] This build requires lockable resources
- [ ] This project is parameterized
- [ ] Throttle builds
- [ ] Disable this project
- [ ] Execute concurrent builds if necessary

Step 4: Open the Nginx project repository page on GitLab and copy the “Clone with HTTP” path.



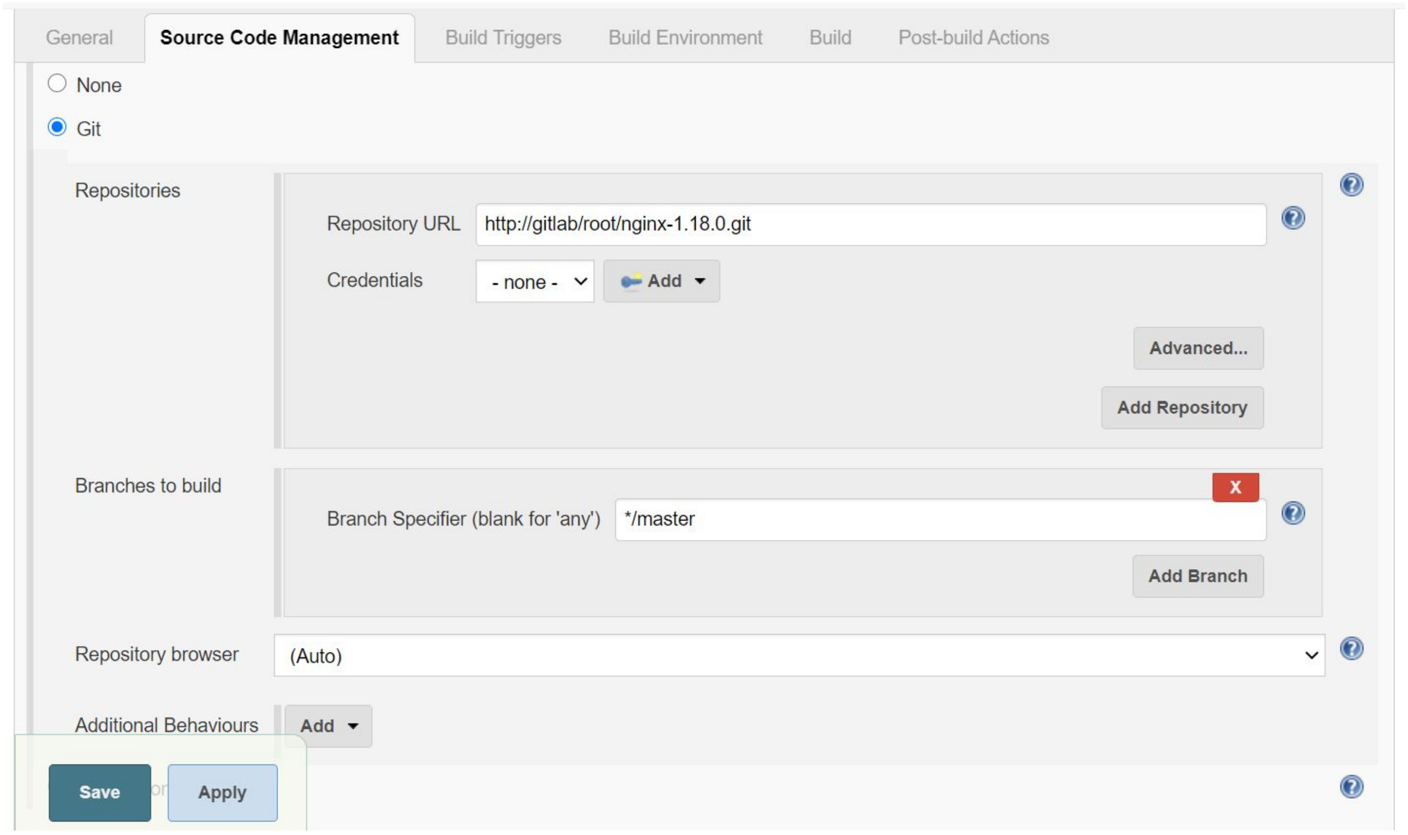
Clone with SSH
```
git@5u0z8dfpxtlcmb5eo858ymzj5.c
```
Clone with HTTP
```
http://5u0z8dfpxtlcmb5eo858ymzj
```

Step 5: Select “Git” in the Source Code Management section and paste this path in the “Repository URL” field.

The copied URL will look something like this:
http://<random_server_URL>/root/nginx-1.18.0.git

This URL is to make sure that the GitLab files can be accessed through web UI. However, to clone it to the Jenkins server, change it to:

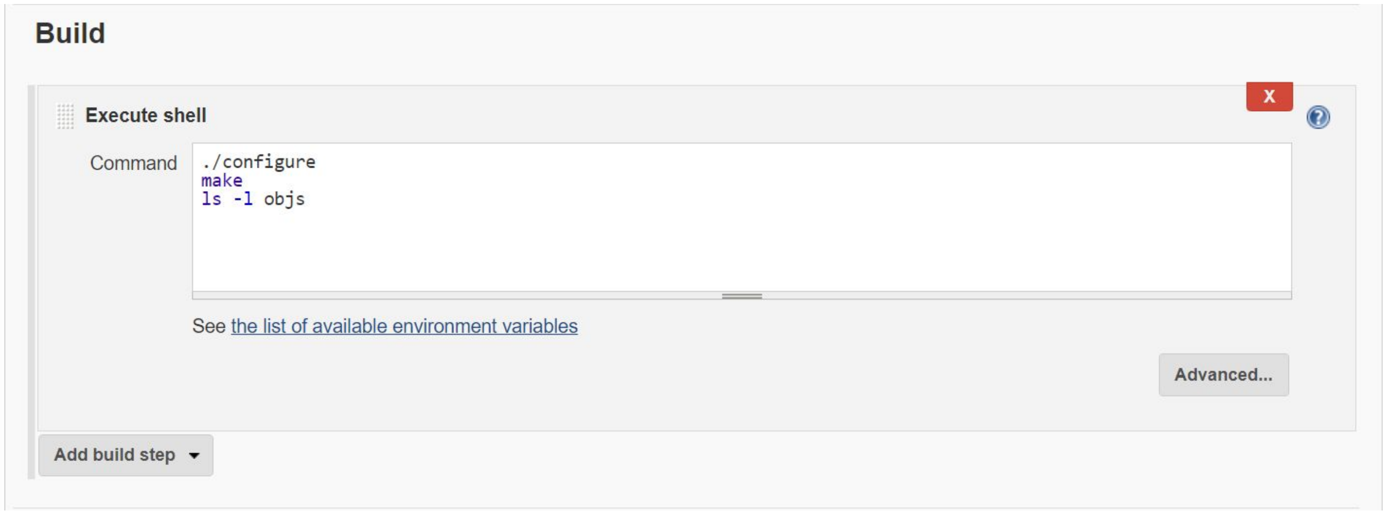
http://gitlab/root/nginx-1.18.0.git



Repository URL: http://gitlab/root/nginx-1.18.0.git
Credentials: - none -
Branch Specifier (blank for 'any'): */master
Repository browser: (Auto)

Step 6: In the build section, select “Execute shell”. Run configure and make to build the Nginx binary. Also, add a directory listing command of the output directory.

```
./configure
make
ls -l objs
```


Build

Execute shell

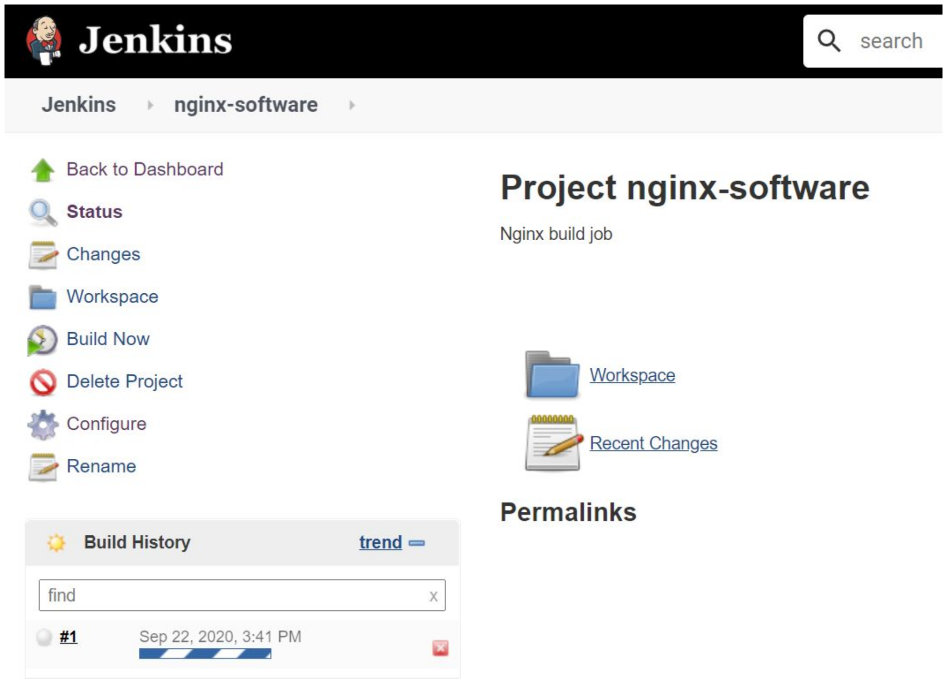
Command

```
./configure
make
ls -l objs
```

See the list of available environment variables

Click on the save button and the job will be saved then the page will redirect to the Job page.

Step 7: Click “Build now” from the left-hand menu to fire the job. An in-progress will appear under the “Build History”.

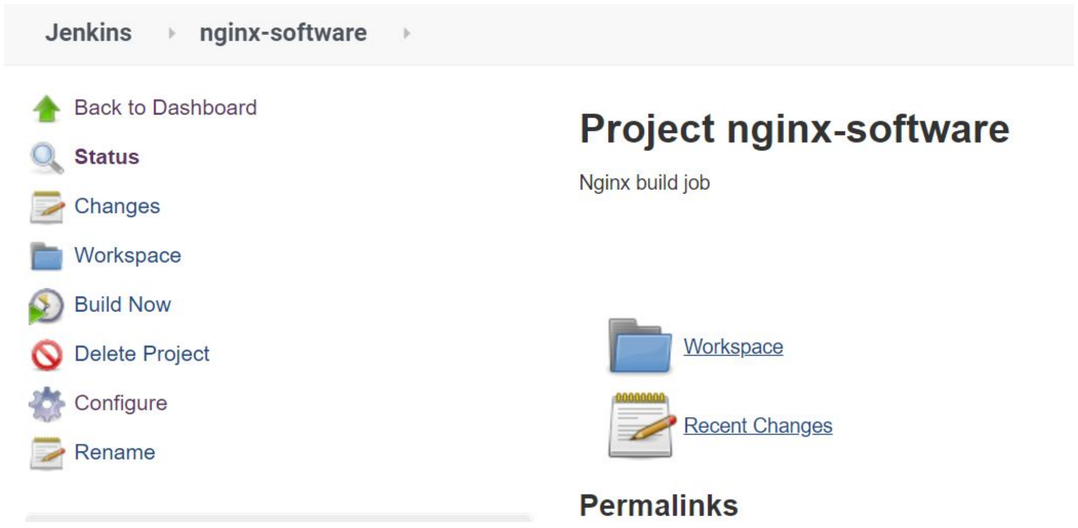


Project nginx-software

Nginx build job

#1 Sep 22, 2020, 3:41 PM

Click on the number #1 to visit the build page.

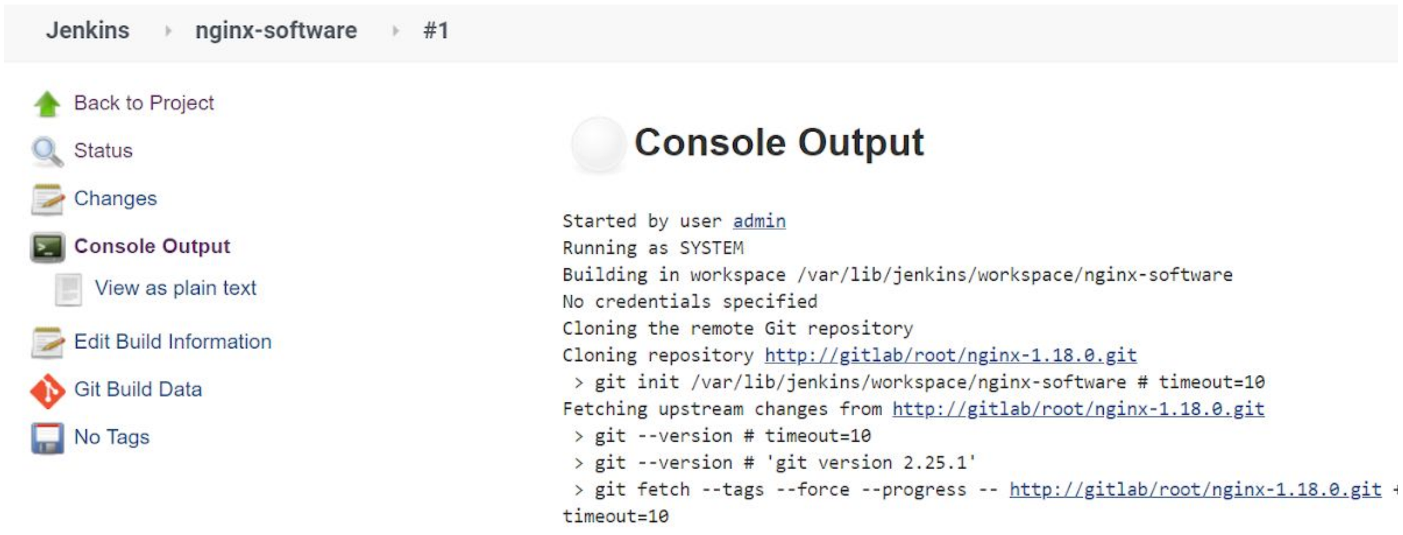


Project nginx-software

Nginx build job

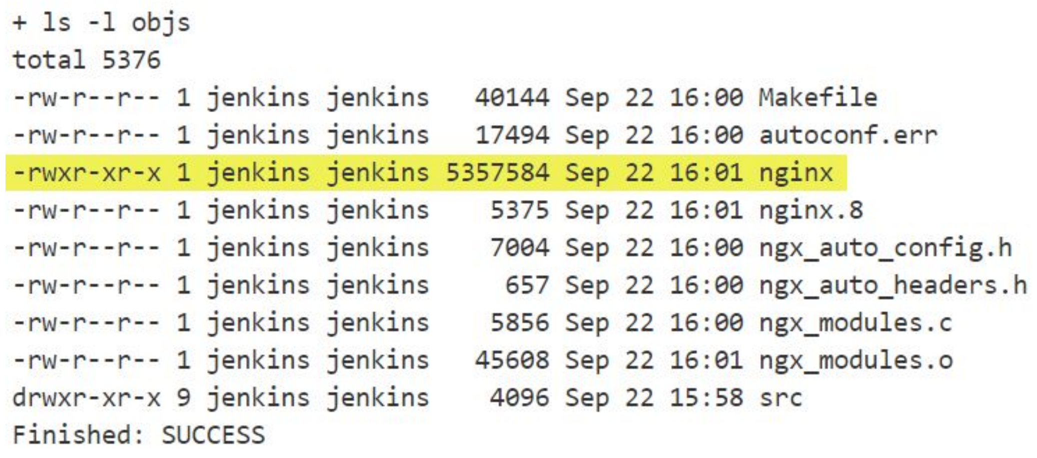
Permalinks

Step 8: Click on “Console Output” to view the build logs.



Console Output

```
Started by user admin
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/nginx-software
No credentials specified
Cloning the remote Git repository
Cloning repository http://gitlab/root/nginx-1.18.0.git
 > git init /var/lib/jenkins/workspace/nginx-software # timeout=10
Fetching upstream changes from http://gitlab/root/nginx-1.18.0.git
 > git --version # timeout=10
 > git --version # 'git version 2.25.1'
 > git fetch --tags --force --progress -- http://gitlab/root/nginx-1.18.0.git
timeout=10
```



```
+ ls -l objs
total 5376
-rw-r--r-- 1 jenkins jenkins   40144 Sep 22 16:00 Makefile
-rw-r--r-- 1 jenkins jenkins   17494 Sep 22 16:00 autoconf.err
-rwxr-xr-x 1 jenkins jenkins 5357584 Sep 22 16:01 nginx
-rw-r--r-- 1 jenkins jenkins    5375 Sep 22 16:01 nginx.8
-rw-r--r-- 1 jenkins jenkins    7004 Sep 22 16:00 ngx_auto_config.h
-rw-r--r-- 1 jenkins jenkins     657 Sep 22 16:00 ngx_auto_headers.h
-rw-r--r-- 1 jenkins jenkins    5856 Sep 22 16:00 ngx_modules.c
-rw-r--r-- 1 jenkins jenkins   45608 Sep 22 16:01 ngx_modules.o
drwxr-xr-x 9 jenkins jenkins    4096 Sep 22 15:58 src
Finished: SUCCESS
```

The job completed successfully and the Nginx binary is available for deployment.

Learning

Building and packaging the Nginx web server using Jenkins.