Getting Familiar with Docker Hub

Step-by-step introduction to Docker Hub

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SIG

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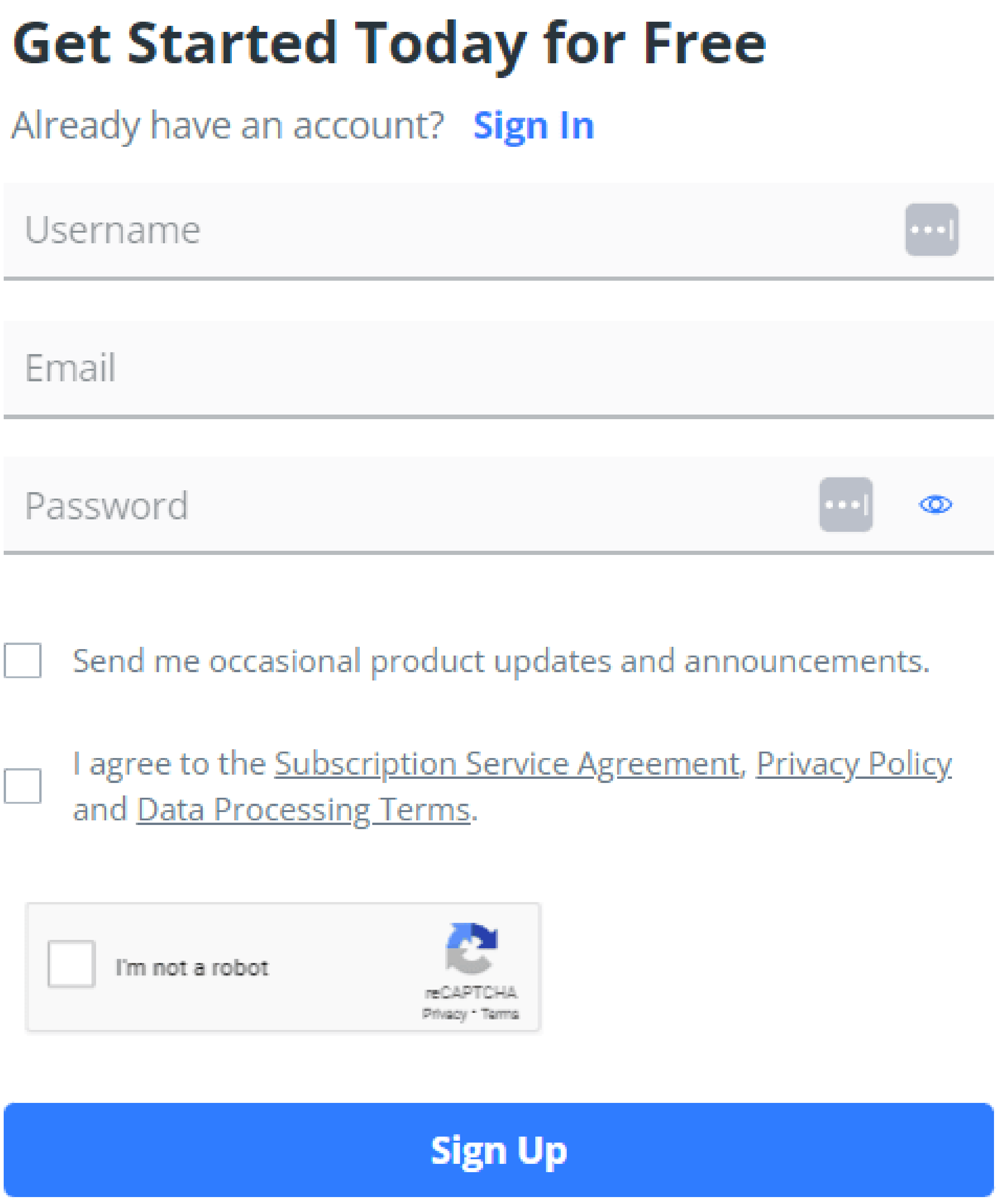
1. Getting Familiar with Docker Hub

1.1. What is Docker Hub

Docker Hub is a library of images and a place to store and share custom images with others in a community environment.

1.2. Register on Docker Hub

Let’s setup a free account. Go to https://hub.docker.com/


Get Started Today for Free

Already have an account? Sign In

Username

Email

Password

Send me occasional product updates and announcements.

I agree to the Subscription Service Agreement, Privacy Policy and Data Processing Terms.

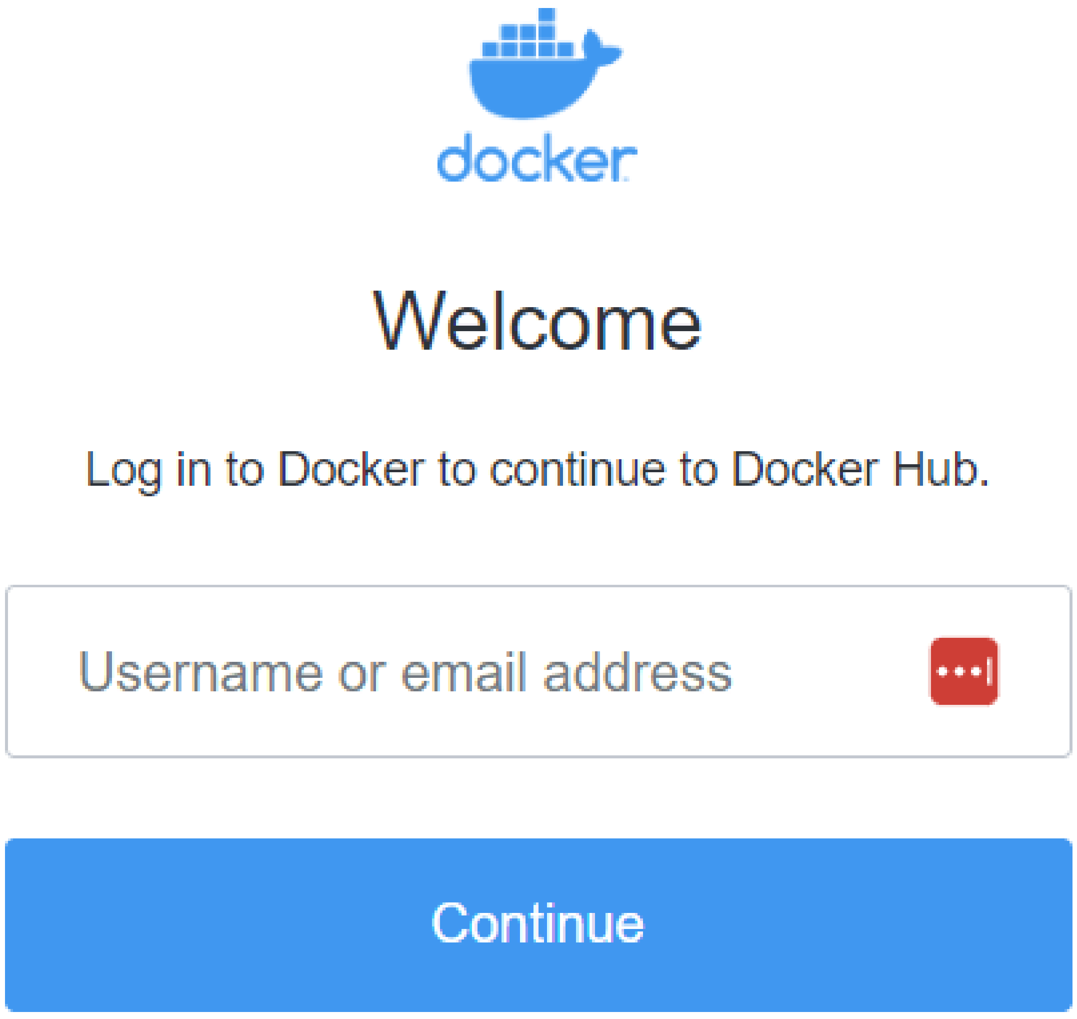
I'm not a robot

reCAPTCHA
Privacy · Terms

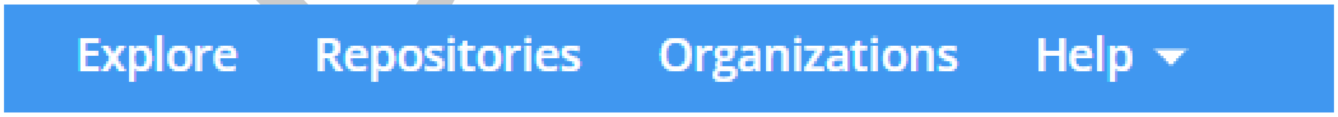
Sign Up

Enter the necessary information and click Sign Up.

Docker will send a verification email to the email address entered on the sign-up page. Click on the link in the email, then go back to Docker Hub and login with the newly created account.

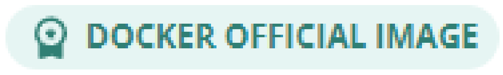

docker
Welcome
Log in to Docker to continue to Docker Hub.
Username or email address
Continue

Let's explore a bit. The menu at the top of the page provides the gateway to all that the Docker Hub has to offer.



1.3. Explore

Explore allows you to browse the vast list of images available in the Docker repositories. At any point, you can use the search box to search for images within the site. Be careful, though. Anyone can post images to the repositories on this site. Some images are officially supported by Docker, some are not. It is important to know the difference. Official images supported by Docker will be identified with the following graphic:

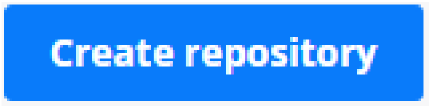


For the purposes of this workshop, we'll be using the official Tomcat image supported by Docker.

1.4. Repositories

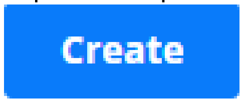
Repositories shows the list of your the repositories in your account. You can create public or private repositories for specific projects. In a free Docker Hub account, you can have only 1 private repo but any number of public repos. For the purpose of this workshop, we'll be creating a repository to store the images we create.

Let's create two repositories, one for Tomcat and one for a Banner application: * Click on



* Enter a name for the repository, like "***mytomcat***". * Enter a description for the repository, like "***Custom Tomcat for Banner docker training at CoHEsion 2022***." * Choose either public or private, keeping in mind that you only have 1 private repository available.

* Click Create



Repeat the above steps for creating a Banner Application repository. We'll use Application Navigator as an example.

You should now have two repositories. We will come back to these later in the workshop.

1.5. Rate Limiting

Docker Hub introduced rate limiting on image pulls from their repositories. It is possible that you may encounter messages like "***You have reached your pull limit***." First, make sure you are logged in to Docker Hub via Docker Desktop. Open a Linux command window , check your current pull rate statistics:

```
sudo apt-get update
sudo apt-get install jq
TOKEN=$(curl
 ↪  "https://auth.docker.io/token?service=registry.docker.io&scope=repository:ratelimitpr
 ↪  | jq -r .token)
curl --head -H "Authorization: Bearer $TOKEN"
 ↪  https://registry-1.docker.io/v2/ratelimitpreview/test/manifests/latest
```

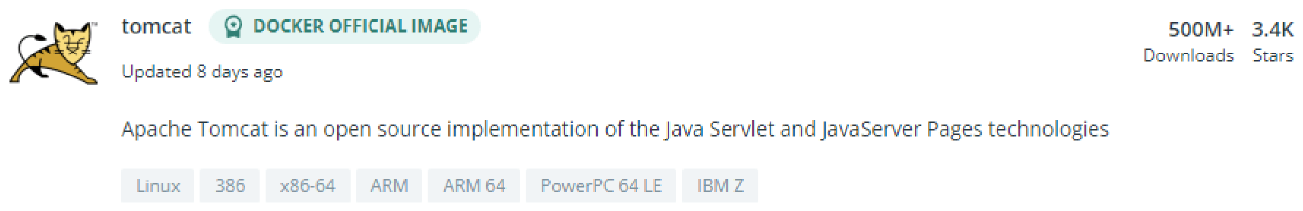
This will produce the header information from the pull request. The lines of interest will be:

```
ratelimit-limit: 100;w=21600
ratelimit-remaining: 100;w=21600
```

This means that the rate limit is 100 pulls per 21600 seconds (6 hours) and there are 100 pulls remaining. We'll want to keep an eye on this during the course of this workshop.

1.6. Searching the Repo

Let's search for the Tomcat image we're going to be using. In the Search box type "***tomcat***"


tomcat DOCKER OFFICIAL IMAGE

Updated 8 days ago

500M+ Downloads 3.4K Stars

Apache Tomcat is an open source implementation of the Java Servlet and JavaServer Pages technologies

Linux 386 x86-64 ARM ARM 64 PowerPC 64 LE IBM Z

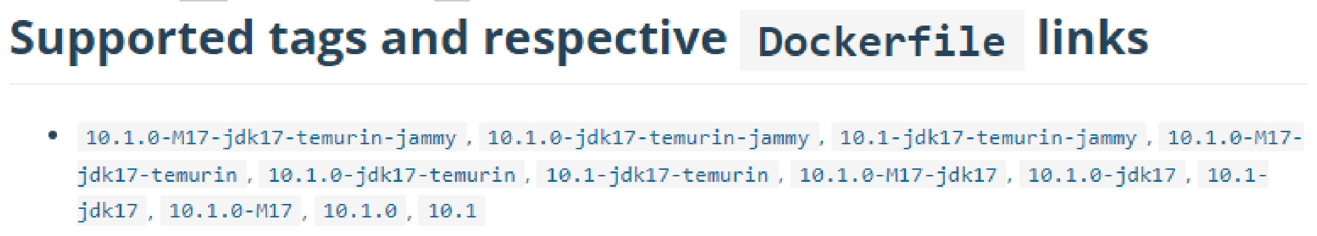
The search list will return all repositories having to do with Tomcat. Notice the Docker Official Image icon on the first item in the list. This indicates we've found the official repository, but let's browse the list first. Scroll down the list and review the different options. Many people have posted their Tomcat images to their public repositories. When you create a public repository, your's too could end up in a search listing like this. Notice there are over 40,000 search results.

Now search for mytomcat and notice how the search results have gone down to about 2,000. Now change the sort option from Best Match to Recently Updated. What do you notice?

Security note: Docker hub is great for learning purposes. However, it if you are going to use it for university business, buy a license and create all repositories as private. Never push university owned objects to a public repository. If you don't want to pay for Docker Hub access, Gitlab has a built-in container registry feature. Gitlab can be installed and managed locally without cost.

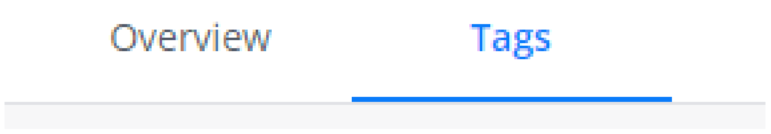
Let's get back to the Official Tomcat Image. Search for tomcat again, this time click anywhere in the box for the official image.

Tags are the different versions of the images that are available. The tag is important to know as the Banner applications aren't always supported on the latest version of Tomcat. It looks like the latest available Tomcat image is v10.1.x.


Supported tags and respective `Dockerfile` links

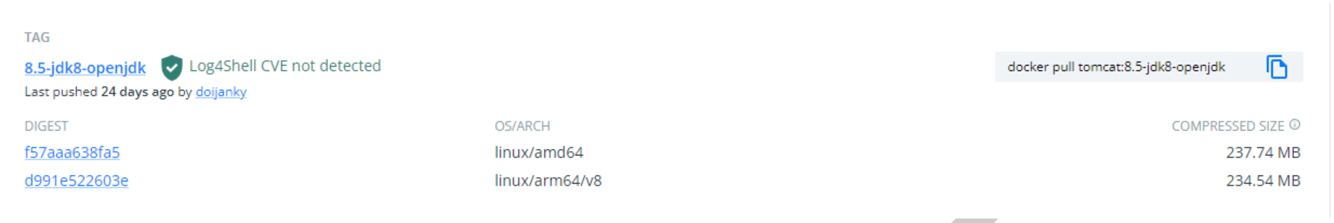
- `10.1.0-M17-jdk17-temurin-jammy`, `10.1.0-jdk17-temurin-jammy`, `10.1-jdk17-temurin-jammy`, `10.1.0-M17-jdk17-temurin`, `10.1.0-jdk17-temurin`, `10.1-jdk17-temurin`, `10.1.0-M17-jdk17`, `10.1.0-jdk17`, `10.1-jdk17`, `10.1.0-M17`, `10.1.0`, `10.1`

We'll probably need a different version. Let's look for v8.5. Click on the Tags tab, next to Overview.



In the Filter box type: "***8.5***". That seems to have reduced the list of images, but there still seems to be quite a long list. Let's narrow that down a bit more. We know that Banner applications must run with JDK v8 if running with Grails v3 or JDK v11 if running with Grails v5 (applications released after September 2022). Let's change the file to "***8.5-jdk8***". That should have reduced the list of images to a single page.

Scroll through the list of images and locate the one for openjdk:



TAG
8.5-jdk8-openjdk Log4Shell CVE not detected
Last pushed 24 days ago by doijanky

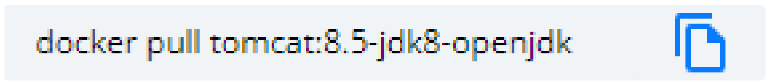
docker pull tomcat:8.5-jdk8-openjdk

DIGEST	OS/ARCH	COMPRESSED SIZE
f57aaa638fa5	linux/amd64	237.74 MB
d991e522603e	linux/arm64/v8	234.54 MB

Click on the link to review how the image was built. Each layer in the build process is just another step that would have been done manually. Linux commands, environment variables getting set, scripts being run. If you've ever installed Tomcat, most of this should look familiar. Review the different layers. What do you notice?

- What OS is being used?
- What is the value of LANG and is it a supported value for Banner applications?
- What packages are being installed and are they really necessary for a Banner environment?
- Where are the default Tomcat applications?

Note the repository and tag notation on the pull command:



```
docker pull tomcat:8.5-jdk8-openjdk
```

We'll need this later in the workshop.

Search Review * Find the right image to use by narrowing the search filter * Review the Image Layers used to create the image to fully understand what the image contains * Note the Pull command contents - this will be used in the Dockerfile we will create