

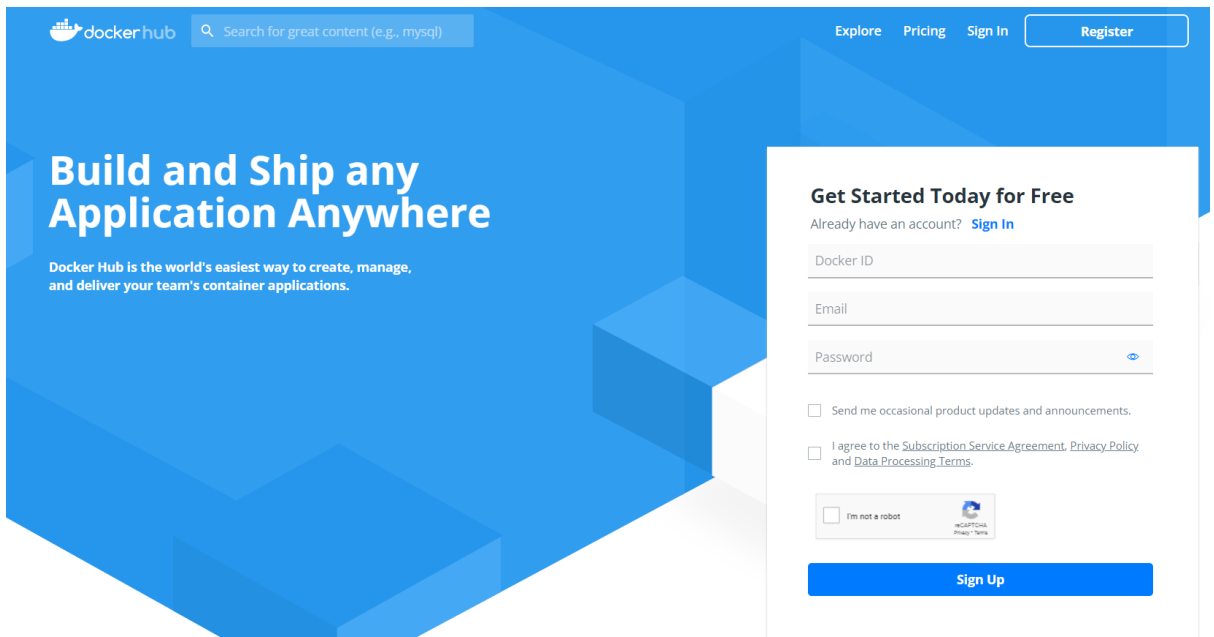
Containerizing application with docker and integration with jenkins

- Install the docker related plugins in jenkins

Manage Jenkins > Manage Plugins >

<input checked="" type="checkbox"/>	Docker Commons Plugin Provides the common shared functionality for various Docker-related plugins.	1.19	<button>Uninstall</button>
<input checked="" type="checkbox"/>	Docker Pipeline Build and use Docker containers from pipelines.	1.28	<button>Uninstall</button>
<input checked="" type="checkbox"/>	Docker plugin This plugin integrates Jenkins with Docker	1.2.8	<button>Uninstall</button>
<input checked="" type="checkbox"/>	docker-build-step This plugin allows to add various docker commands to your job as build steps.	2.8	<button>Uninstall</button>
<input checked="" type="checkbox"/>	CloudBees Docker Build and Publish plugin This plugin enables building Dockerfile based projects, as well as publishing of the built images/repos to the docker registry.	1.3.3	<button>Uninstall</button>

- Create a repository account to store docker images ([Docker hub](#))



The screenshot shows the Docker Hub homepage with a blue geometric background. The main heading is "Build and Ship any Application Anywhere". Below it, a subheading states: "Docker Hub is the world's easiest way to create, manage, and deliver your team's container applications." The top navigation bar includes the Docker Hub logo, a search bar, and links for Explore, Pricing, Sign In, and Register. A "Get Started Today for Free" registration form is overlaid on the right side of the page. The form includes fields for Docker ID, Email, and Password, along with checkboxes for product updates, terms agreement, and a CAPTCHA verification.

Build and Ship any Application Anywhere

Docker Hub is the world's easiest way to create, manage, and deliver your team's container applications.

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[Sign Up](#)

- **Configure the docker hub account credentials in jenkins**

Manage Jenkins > Manage credentials > Add new credentials

Global credentials (unrestricted)

Credentials that should be available irrespective of domain specification to requirements matching.

ID	Name	Kind	Description
faabb546-eb6d-43e1-be5d-a57fd17bcef9	Global (jenkins,nodes,items)/***** (github token)	Username with password	github token
7794c78f-5367-4de9-b906-eb4eeb643bbe	albinvpoulouse/***** (docker-info)	Username with password	docker-info

Icon: [S](#) [M](#) [L](#)

- **Create a new angular application.** [Click here](#)

[Sample angular application](#)

- **Add the docker file to the application root directory and add the steps to containerize the app**

node_modules	19-04-2022 22:29	File folder	
src	19-04-2022 13:04	File folder	
.browserslistrc	19-04-2022 13:04	BROWSERSLISTRC...	1 KB
.editorconfig	19-04-2022 13:04	EDITORCONFIG File	1 KB
.gitignore	19-04-2022 13:04	GITIGNORE File	1 KB
angular.json	19-04-2022 22:19	JSON File	4 KB
Dockerfile	19-04-2022 13:04	File	1 KB
jenkins-script	19-04-2022 13:04	Text Document	3 KB
karma.conf	19-04-2022 13:04	JavaScript File	2 KB
LICENSE	19-04-2022 13:04	File	2 KB
package.json	19-04-2022 22:19	JSON File	2 KB
package-lock.json	19-04-2022 22:19	JSON File	344 KB
README.md	19-04-2022 13:04	MD File	1 KB

```

Dockerfile
1 FROM nginx:18
2 COPY /dist/cicd-p1 /usr/share/nginx/html
3 COPY /dist/assets/conf/nginx.conf /etc/nginx/
4

```

- Create a pipeline job for the CICD

Enter an item name

front-end-pipeline
* 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.

Maven project
Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

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.

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

Organization Folder
Creates a set of multibranch project subfolders by scanning for repositories.

If you want to create a new item from other existing, you can use this option:

Copy from

OK

- Configure the source code management tool

☐ Discard old builds ?

☐ Do not allow concurrent builds

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

☒ GitHub project ?

Project url ?

Advanced...

- Create a repository in docker hub



Create Repository

albinvpoulouse ▼ front-end-angular

demo image

Visibility

Using 0 of 1 private repositories. [Get more](#)

- ☒ **Public**  Appears in Docker Hub search results
- ☐ **Private**  Only visible to you

Cancel

Create

- Add the pipeline script to the job

Pipeline

Definition

Pipeline script

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```

```
environment {
  //once you sign up for Docker hub, use that user_id here
  registry = "albinvpoulouse/front-end-angular"
  //- update your credentials ID after creating credentials for connecting to Docker Hub
  registryCredential = '7794c78f-5367-4de9-b906-eb4eeb643bbe'
  dockerImage = ''
}
```

- Save the job and execute

[Add description](#)

All	demo-pipeline	demo-view	+				
S	W	Name	Last Success	Last Failure	Last Duration		
		angular-ci-demo	2 mo 27 days - #1	N/A	4 min 53 sec		
		backend-pipeline	N/A	N/A	N/A		
		ci-job-1	2 mo 27 days - #2	N/A	2 min 48 sec		
		ci-job-2	2 mo 27 days - #2	N/A	3 min 16 sec		
		front-end-pipeline	3 days 3 hr - #6	3 days 4 hr - #5	7 min 0 sec		

Icon: S M L Icon legend Atom feed for all Atom feed for failures Atom feed for just latest builds

- Check the job output in the output console

(click on the job name) > (click on the job execution index) > Console output

Console Output

```
Started by user albin-vp
[Pipeline] Start of Pipeline
[Pipeline] node (hide)
Running on Jenkins in /var/lib/jenkins/workspace/p3@2
[Pipeline] {
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Cloning Git & environment setup)
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/p3@2/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/Albinvadakan/cicd-pl.git # timeout=10
Fetching upstream changes from https://github.com/Albinvadakan/cicd-pl.git
> git --version # timeout=10
> git --version # 'git version 2.17.1'
> git fetch --tags --progress -- https://github.com/Albinvadakan/cicd-pl.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/main^{commit} # timeout=10
Checking out Revision 5237315d6c44a3eff86e12d868c83d9a2b0ef054 (refs/remotes/origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f 5237315d6c44a3eff86e12d868c83d9a2b0ef054 # timeout=10
> git branch -a -v --no-abbrev # timeout=10
> git branch -D main # timeout=10
> git checkout -b main 5237315d6c44a3eff86e12d868c83d9a2b0ef054 # timeout=10
Commit message: "docker pwd update"
> git rev-list --no-walk 5237315d6c44a3eff86e12d868c83d9a2b0ef054 # timeout=10
[Pipeline] nodejs
[Pipeline] {
[Pipeline] sh
+ npm install
npm WARN old lockfile
npm WARN old lockfile The package-lock.json file was created with an old version of npm,
npm WARN old lockfile so supplemental metadata must be fetched from the registry.
npm WARN old lockfile
npm WARN old lockfile This is a one-time fix-up, please be patient...
npm WARN old lockfile

up to date, audited 911 packages in 3m

101 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
[Pipeline] }
[Pipeline] // nodejs
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (building application)
[Pipeline] nodejs
[Pipeline] {
[Pipeline] sh
+ npm run prod-build

> cicd-pl@0.0.0 prod-build
> ng build --prod
```

```
Node.js version v17.3.1 detected.
Odd numbered Node.js versions will not enter LTS status and should not be used for production. For more information, please see https://nodejs.org/en/about/releases/.
Option "--prod" is deprecated: No need to use this option as this builder defaults to configuration "production".
- Generating browser application bundles (phase: setup)...
✓ Browser application bundle generation complete.
✓ Browser application bundle generation complete.
✓ Copying assets...
✓ Copying assets complete.
- Generating index.html...
✓ Index.html generation complete.

Initial Chunk Files | Names | Raw Size | Estimated Transfer Size
main.a9ec3518f8b59e8e.js | main | 192.12 kB | 52.88 kB
polyfills.1a8fc9647da03d3a.js | polyfills | 33.02 kB | 10.59 kB
runtime.47f8457997a2d1cc.js | runtime | 1.04 kB | 597 bytes
styles.e746db3751d8e999.css | styles | 0 bytes | -
| Initial Total | 226.17 kB | 64.06 kB


Build at: 2022-04-18T13:14:48.522Z - Hash: e5b07369f3d63d9b - Time: 28941ms
[Pipeline] }
[Pipeline] // nodejs
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Building image)
[Pipeline] script
[Pipeline] {
[Pipeline] isUnix
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ docker build -t albinvpoulose/demo-images .
Sending build context to Docker daemon 291.8MB


Step 1/2 : FROM nginx
--> 12766a6745ee
Step 2/2 : COPY /dist/cicd-pl /usr/share/nginx/html
--> Using cache
--> 70b2333ab5b4
Successfully built 70b2333ab5b4
Successfully tagged albinvpoulose/demo-images:latest
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Upload Image)
[Pipeline] script
[Pipeline] {
[Pipeline] withEnv
[Pipeline] {
[Pipeline] withDockerRegistry
$ docker login -u albinvpoulose -p ***** https://index.docker.io/v1/
WARNING! Using --password via the CLI is insecure. Use --password-stdin.
WARNING! Your password will be stored unencrypted in /var/lib/jenkins/workspace/p3q2tmp/0a90b433-d278-44c8-b1b2-52e2b2754721/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store


Login Succeeded
[Pipeline] {
[Pipeline] isUnix
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ docker tag albinvpoulose/demo-images albinvpoulose/demo-images:latest
+ docker push albinvpoulose/demo-images:latest
The push refers to repository [docker.io/albinvpoulose/demo-images]
0b5788f2aaf4: Preparing
ea4bc0cd4a93: Preparing
fac199a5a1a5: Preparing
5c77d760e1f4: Preparing
33cf1b723f65: Preparing
ea207a4854e7: Preparing
608f3a074261: Preparing
ea207a4854e7: Waiting
608f3a074261: Waiting
fac199a5a1a5: Mounted from library/nginx
ea4bc0cd4a93: Mounted from library/nginx
33cf1b723f65: Mounted from library/nginx
5c77d760e1f4: Mounted from library/nginx
ea207a4854e7: Mounted from library/nginx
0b5788f2aaf4: Pushed
608f3a074261: Mounted from library/nginx
latest: digest: sha256:0b8792d816126ef2a07fd6c911c33alb2afb2356c79c61473d1ec95007de9d5d size: 1779
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withDockerRegistry
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Docker Run)
[Pipeline] echo
Deploying application
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

- Create a node.js express backend with and configure the jenkins pipeline job with application specific docker image creation and build steps
- Check the docker hub repositories once after the successful completion of the jenkins job


Front-end repository


albinvpoulose / front-end-angular



demo image


 Last pushed: in a few seconds

Tags and Scans



VULNERABILITY SCANNING - DISABLED
[Enable](#)


This repository contains 1 tag(s).


TAG	OS	PULLED	PUSHED
 latest		---	in a few seconds

[See all](#)


Backend repository


albinvpoulose / backend-express



demo backend image


 Last pushed: in a few seconds

Tags and Scans


VULNERABILITY SCANNING - DISABLED
[Enable](#)

This repository contains 1 tag(s).

TAG	OS	PULLED	PUSHED
 latest		---	in a few seconds

[See all](#)

- Pull the front and backend docker images from the docker hub repository in the target environment

```

albin@albin-VirtualBox:~$ docker pull albinvpoulose/front-end-angular
Using default tag: latest
latest: Pulling from albinvpoulose/front-end-angular
Digest: sha256:2426656bbd7b595789feeedc7b7c6dedab17d3129d0e480e13f8951c7ad552f4
Status: Image is up to date for albinvpoulose/front-end-angular:latest
albin@albin-VirtualBox:~$

```

```

albin@albin-VirtualBox:~$ docker pull albinvpoulose/backend-express
Using default tag: latest
latest: Pulling from albinvpoulose/backend-express
Digest: sha256:af13e8692a75c3af9867e3da249f68767dfbe99eb0195c43307146a0d153a1a5
Status: Image is up to date for albinvpoulose/backend-express:latest
albin@albin-VirtualBox:~$

```

- Run the generated docker container using the container id

```

albin@albin-VirtualBox:~$ docker run -p 80:80 --name=front-end-demo-app f3e33e3459e9
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2022/04/22 01:20:42 [notice] 1#1: using the "epoll" event method
2022/04/22 01:20:42 [notice] 1#1: nginx/1.21.6
2022/04/22 01:20:42 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2022/04/22 01:20:42 [notice] 1#1: OS: Linux 5.0.0-23-generic
2022/04/22 01:20:42 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2022/04/22 01:20:42 [notice] 1#1: start worker processes
2022/04/22 01:20:42 [notice] 1#1: start worker process 31

```

```

albin@albin-VirtualBox:~$ docker run -p 3000:3000 --name=demo-backend-app eb7fc2045056
> assignment-1@1.0.0 start
> node server.js

server is running in port 3000

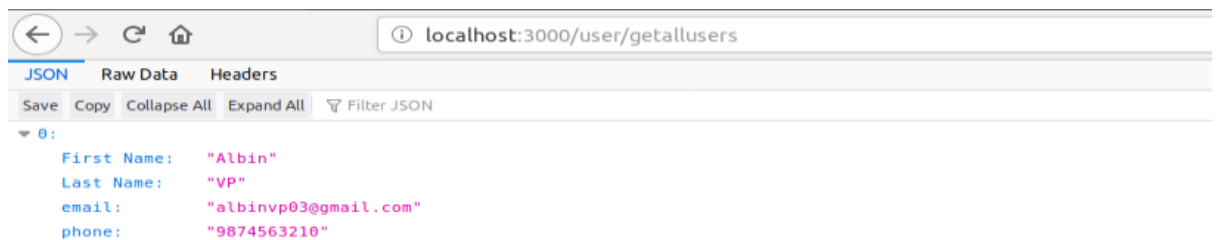
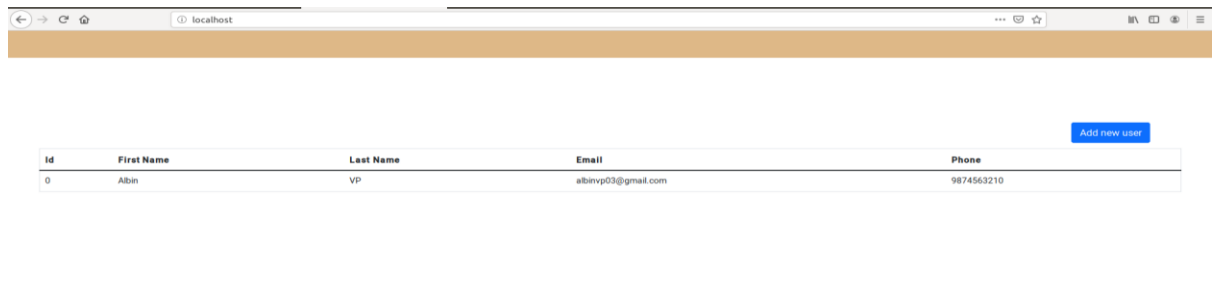
```

```

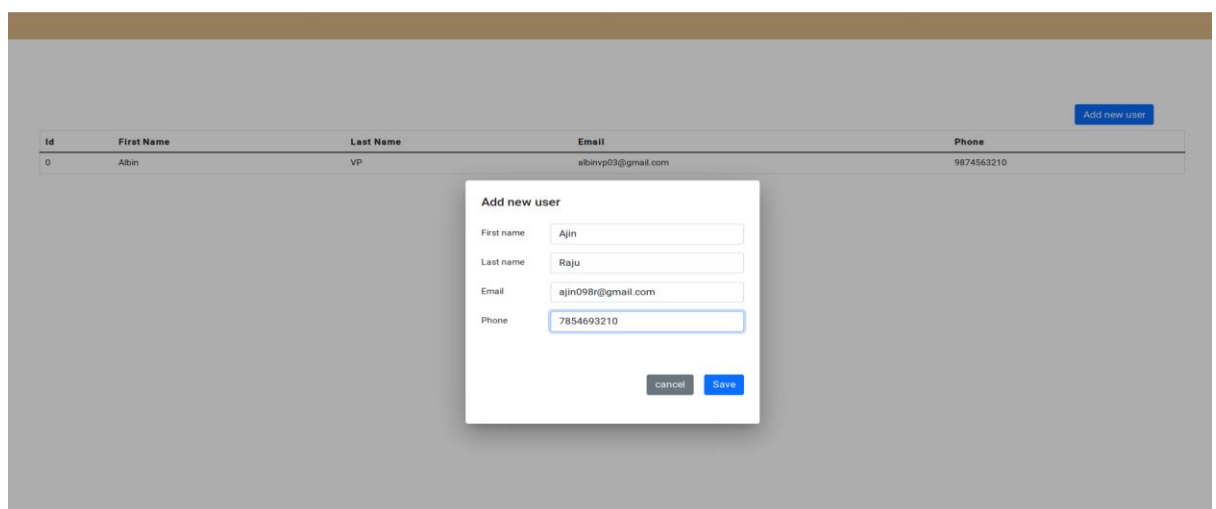
albin@albin-VirtualBox:~$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                                                                                                     NAMES
f6e3a0db5f08   f3e33e3459e9                       "/docker-entrypoint..." 15 minutes ago Up 15 minutes 0.0.0.0:80->80/tcp, :::80->80/tcp                             front-end-demo-app
d4b13b78eeee9   eb7fc2045056                       "/docker-entrypoint..." 28 minutes ago Up 28 minutes 0.0.0.0:3000->3000/tcp, :::3000->3000/tcp                     demo-backend-app
albin@albin-VirtualBox:~$

```


- Check the application in the browser



- Add a new user record from front end and check the application





Add new user

Id	First Name	Last Name	Email	Phone
0	Albin	VP	albinvp03@gmail.com	9874563210
1	Ajin	Raju	ajin098r@gmail.com	7854693210

⬅️➡️🔄🏠

localhost:3000/user/getallusers

JSONRaw DataHeaders

SaveCopyCollapse AllExpand All🔍 Filter JSON

▼ 0:

First Name: "Albin"

Last Name: "VP"

email: "albinvp03@gmail.com"

phone: "9874563210"

▼ 1:

First Name: "Ajin"

Last Name: "Raju"

email: "ajin098r@gmail.com"

phone: "7854693210"