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# **LOFAR Docker Images**

We offer the LOFAR software as Docker images, allowing anyone to run our software using the same configuration, without having to build it. Our images can be browsed at <a href="https://hub.docker.com/r/lofar/">https://hub.docker.com/r/lofar/</a>.

# LOFAR Interferometry Post-Processing Software

To run the lofar pipeline software, you need to:

- 1. Install and configure Docker on your computer (Mac/Linux/Windows)
- 2. Download and start the LOFAR image by running:

```
docker run -it --rm -u $UID -e USER -e HOME -v $HOME:$HOME lofar/lofar-
pipeline:LOFAR-Release-2_19
```

To list all available versions, go to https://hub.docker.com/r/lofar/lofar-pipeline/tags/.

3. You now have the LOFAR software available at your finger tips, and your home directory available. You can run for example:

```
you@3617438dfc63:/$ NDPPP
Usage: DPPP [-v] [parsetfile] [parsetkeys...]
parsetfile: a file containing one parset key=value pair per line
parsetkeys: any number of parset key=value pairs, e.g. msin=my.MS
```

or:

```
you@3617438dfc63:/$ long_baseline_pipeline.py
/opt/lofar/lib/python2.7/site-packages/lofarpipe/support/utilities.pyc
: Using default subprocess module!
Usage: /opt/lofar/bin/long_baseline_pipeline.py <parset-file>
[options]
Results:
```

or one of our dependencies:

```
you@3617438dfc63:/$ /opt/aoflagger/bin/aoflagger
AOFlagger 2.8.0 (2016-06-21) command line application
This program will execute an RFI strategy as can be created with the
RFI gui
and executes it on one or several observations.

Author: André Offringa (offringa@gmail.com)
```

```
Usage: ./aoflagger [options] <obs1> [<obs2> [..]]
...
```

# **LOFAR Pulsar Post-Processing Software**

To run the lofar pipeline software, you need to:

- 1. Install and configure Docker on your computer (Mac/Linux/Windows)
- 2. Download and start the LOFAR image by running:

```
docker run -it --rm -u \UID -e \USER -e \HOME -v \HOME:\HOME \lofar/\lofar-pulp:\LOFAR-Release-2_19
```

To list all available versions, go to https://hub.docker.com/r/lofar/lofar-pulp/tags/.

3. You now have the LOFAR pulp software available at your finger tips, and your home directory available. You can run for example:

```
you@3617438dfc63:/$ pulp.py
Usage: pulp.py <--id ObsID> [-h|--help] [OPTIONS]
```

## Q&A

### Installation

O: Where can I find a list of available LOFAR software versions?

A: For lofar-pipeline, surf to https://hub.docker.com/r/lofar/lofar-pipeline/tags/. For lofar-pulp, surf to https://hub.docker.com/r/lofar/lofar-pulp/tags/.

#### Q: What is included in the image?

We put the following in our lofar-pipeline image:

- LOFAR Pipeline Framework & Recipes
- NDPPP
- AWImager
- AOFlagger
- DAL2
- Casacore + casarest + python-casacore

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## **Running the software**

#### Q: I can't see my data or parset?

Once you have the Docker image up and running, you will need some data to work on, and likely a parset with configuration settings. If you've put both in your home directory, they're immediately available when running with the commands described on this page. If not, you can use additional "-v" parameters to make more directories available in your Docker container.

#### Q: I get "Illegal instruction" when running some of the software?

A: The LOFAR software is compiled for a 2015-era processor (Intel Xeon E5-2603v3 to be exact) for performance reasons, and uses CPU instructions not available on older machines. Please run our images on a newer machine, or rebuild the Docker images from scratch.

## **Development (extending the software)**

#### Q: How do I obtain your Dockerfiles?

#### A: By running:

```
svn co -N https://svn.astron.nl/LOFAR/branches/LOFAR-Release-2_19/
cd LOFAR-Release-2_19
svn up CMake
mkdir -p build/gnu_opt && cd build/gnu_opt

cmake ../.. -DBUILD_PACKAGES=Docker -DUSE_LOG4CPLUS=OFF -DUSE_CASACORE=OFF
&& make -j 16 install
```

which will put the Dockerfiles in subdirectories in LOFAR-Release-2 19/build/gnu opt/installed/share/docker.

#### Q: How do I build your Docker images from scratch?

A: By obtaining the Dockerfiles (see above), and running:

```
# load LOFAR environment variables, used to determine tags etc
source installed/lofarinit.sh
# build all LOFAR images, in the order required by their interdependencies
docker-build-all.sh
```

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#### Q: How do I add files/modifications permanently?

A: The best way to add stuff to our images is by creating a new image based on ours. To do so, create a directory containing the files you want to add. Add to this directory a Dockerfile that describes your extension, for example:

FROM lofar-pipeline:LOFAR-Release-2 19

COPY my extension /opt/my extension

Finally, you run

docker build -t myimage:mytag directory/

where directory is the directory containing the Dockerfile, and myimage:mytag is the name and tag of your new image (instead of lofar-pipeline:LOFAR-Release-2\_19). See also the Docker manual on how to make and use Dockerfiles.

#### Q: How do I add initialisation stuff? (PYTHONPATH, etc)

A: Our Docker images execute /opt/bashrc upon entry, which in turn reads and sources all the files in /opt/bashrc.d/ in order. You can thus add bash files to this directory that contain your initialisation statements, f.e. a file called 20-myextension containing export PYTHONPATH=\$PYTHONPATH:/opt/my extension.

Note: if you add eggs to the image, you need to put the egg *filename* to the PYTHONPATH. It is not enough to add the directory containing the egg.

From:

https://www.astron.nl/lofarwiki/ - LOFAR Wiki

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