

AHIR DOCKER INSTALLATION GUIDE

STEP 1: Install docker -

To install docker on **Ubuntu**:

1. `sudo apt-get install docker`
2. `sudo apt-get -y install docker.io`

For Windows: Download & run the Docker desktop installer for windows

<https://www.docker.com/products/docker-desktop/>

If that does not work, please follow the steps given below -

1. `sudo apt update`
2. `sudo apt install apt-transport-https ca-certificates curl software-properties-common`
3. `curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -`
4. `sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $(lsb_release -cs) stable"`
5. `sudo apt-get -y install docker-ce`
6. `sudo systemctl status docker`
 - a. Output -
 - docker.service - Docker Application Container Engine
 - Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset: enabled)
 - Active: **active** (running) since Tue 2020-05-19 17:00:41 UTC; 17s ago
 - TriggeredBy: ● docker.socket
 - Docs: <https://docs.docker.com>
 - Main PID: 24321 (dockerd)
 - Tasks: 8
 - Memory: 46.4M
 - CGroup: /system.slice/docker.service
 - └─24321 /usr/bin/dockerd -H fd://
 - containerd=/run/containerd/containerd.sock

At this point, docker should be installed in your system

STEP 2 : Loading docker Image

Note For Windows Users: Use Windows Powershell to perform following steps & remove sudo from commands

1. Download the file ahir_img.tar.gz. ([Link](#)) (File size - 1.5 GB, check that the download is complete before proceeding)

The next step will require 5-6 GB of disk space. Ensure that you have enough free space on your device before loading

2. Run "(sudo) docker load -i ahir_img.tar.gz"

STEP 3 : Running and testing

3. Run "(sudo) docker run -it [OPTIONS] ahir_img:deploy"
[OPTIONS] := -v /your/directory/to/mount/:/home // To mount your directory on docker, not required for sample problem.
-user \$(id -u):\$(id -g) // Explained in Appendix below, not required for the sample problem
4. You should now be inside the docker container, run the following commands to test the setup -
 - a. cd /release/example
 - b. make
5. If the make is successful,
 - a. Run ./testbench_sw to run the software simulation. You will see the terminal output ending with:

```
Result = 0, expected = 0.  
Result = 1, expected = 1.  
Result = 4, expected = 4.  
Result = 9, expected = 9.  
Result = 16, expected = 16.  
Result = 25, expected = 25.  
Result = 36, expected = 36.  
Result = 49, expected = 49.  
Result = 64, expected = 64.  
Result = 81, expected = 81.  
Result = 100, expected = 100.  
Result = 121, expected = 121.  
Result = 144, expected = 144.  
Result = 169, expected = 169.  
Result = 196, expected = 196.  
Result = 225, expected = 225.  
Result = 256, expected = 256.  
Result = 289, expected = 289.  
Result = 324, expected = 324.  
Result = 361, expected = 361.  
Result = 400, expected = 400.  
Result = 441, expected = 441.  
Result = 484, expected = 484.  
Result = 529, expected = 529.  
Result = 576, expected = 576.  
Result = 625, expected = 625.  
Result = 676, expected = 676.  
Result = 729, expected = 729.  
Result = 784, expected = 784.  
Result = 841, expected = 841.  
Result = 900, expected = 900.  
Result = 961, expected = 961.
```

Fig 1 : Output for example hardware

- b. If it proceeds correctly, we move to hardware simulation:
 - i. Run "tmux" in the container
 - ii. Split into two terminals using Ctrl+B followed by % (can toggle between terminals using Ctrl+B followed by ;)
 - iii. On the first terminal, execute ./testbench_hw
 - iv. On the second terminal, run ./ahir_system_test_bench
 - v. If the simulation is correct, same output as shown in Fig 1 should be observed

APPENDIX

A. Run Docker Without Sudo - (UBUNTU USERS)

To run docker without root privileges, run the following in your terminal after installing docker:

1. `sudo groupadd docker`
2. `sudo usermod -aG docker $USER`
3. `newgrp docker`
4. `docker run ahir_img` # To test whether the above was successful

If you get an error “Got permission denied while trying to connect to the Docker daemon socket at unix” at a later stage, run step 3 on the terminal and continue

B. Create files with user permissions (not root)

1. Run Docker with the option “`-user $(id -u):$(id -g)`”

The above will work only after steps in APPENDIX A are performed