

Docker Containers and Server Setup

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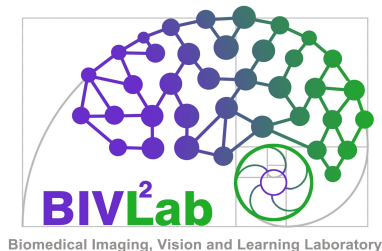
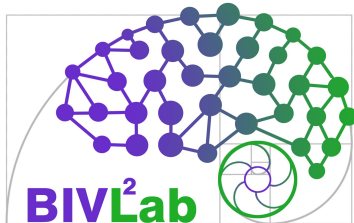


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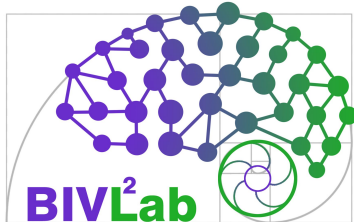
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Introduction

Server Specs

- Processor: AMD Ryzen Threadripper 1920x (12 Cores, 24 Threads, Base Clock 3.5GHz, Max Boost Clock 4GHz)
- RAM: 64GB
- Swap: 512 GB
- Graphics: Nvidia Titan V with 12 GB VRAM DDR6
- Storage: 1 TB (SSD) 6.5 TB (4 Disk HDD)
- SO: Ubuntu 16.04 LTS
- Network: 2 Ethernet Gigabyte with IP address 10.5.5.185 and 10.5.5.186 (Not available until the new disk come)



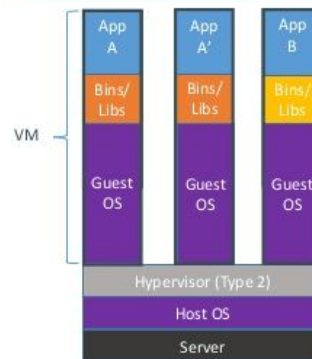
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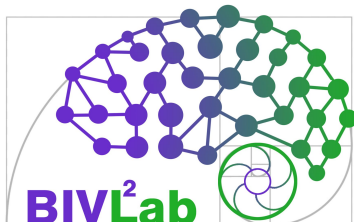
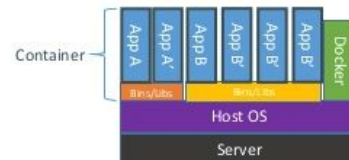
What is Docker?

- Docker is a tool designed to make it easier to create, deploy, and run applications by using containers.
- Docker is a bit like a virtual machine. But unlike a virtual machine, allows applications to use the same Linux kernel.
- And most important... Is Open Source!

Containers vs. VMs



Containers are isolated, but share OS and, where appropriate, bins/libraries



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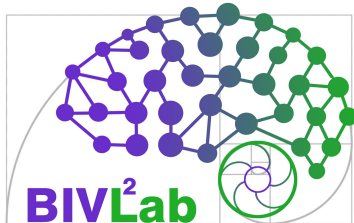


Rules of the Server

User Accounts

- Everybody in the group will have an user without sudo. Why? 'cause nobody wants that you destroy the server SO ;)
- To create your user contact me (Edgar Rangel) and we will create your user to the server.

EVERYBODY WANTS
SUDO POWERS BUT...



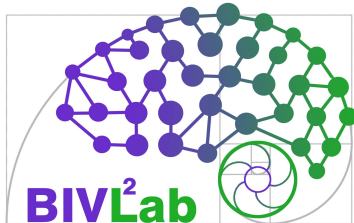
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Folders and Storage

- Everybody have a Home Folder where you and only you have write permissions there.
- Everybody can see the other users home folders but no more. You can't modify others archives.
- The server will have a shared folder for everybody (/home/data) when everybody can run, modify and see the archives there.
- We have 6.5TB of Storage so be responsible with your archives.

When your phone is running out of storage so you delete all your photos of family and friends to save your memes



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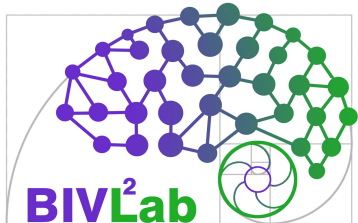
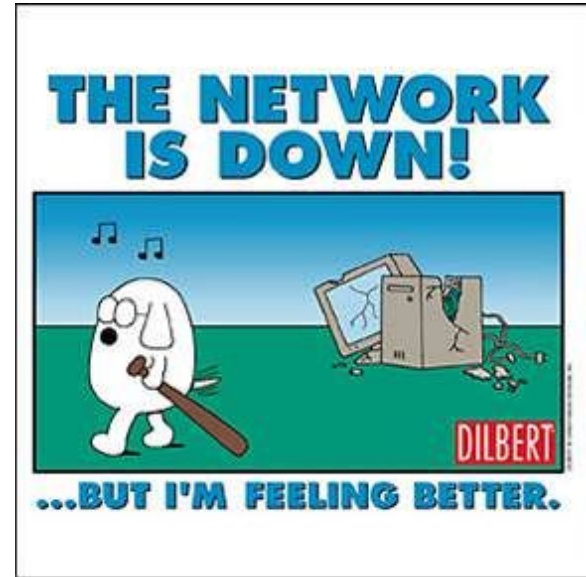


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Network

- The input with IP address **10.5.5.185** have the url **bivl2ab.uis.edu.co** and only is for **RUNNING EXPERIMENTS OR SCRIPTS.**
- The input with IP address **10.5.5.186** doesn't have an url but **ITS USE IS FOR DATA UPLOADING ONLY** Of course you can access terminal from there but be aware that will be too slow to execute commands from there.



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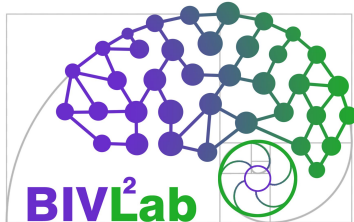
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Docker Usage

Everybody in the group can use docker but...

- Respect the other members ports
- Don't stop other dockers
- Don't access to the other dockers
- You can destroy your docker container, anyways you can create new one
- The best practice is to have one container per user but you can have all that you want... Only remember to respect the storage in the server.



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How to Use the Server?

Outside

- Out of the UIS you can only access to the server by ssh (port 22) and http (port 80)
- To access to http open your browser and go to the url:

bivl2ab.uis.edu.co

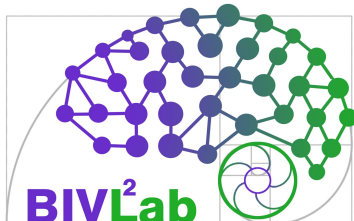
This open the webpage only...

- To access to ssh open your terminal or cmd and type:

ssh <your_username>@bivl2ab.uis.edu.co

Then type your password and that's it! You have access to the server.

- **Future feature:** Access to Jupyter Notebook out of the UIS. For now use Anydesk or TeamViewer



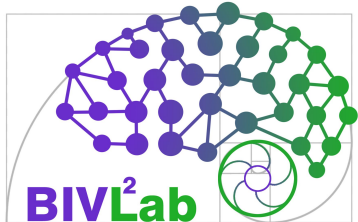
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Inside

- The same methods that Outside but you can access to your Jupyter Notebook by typing in the browser:

bivl2ab.uis.edu.co:<your_port>



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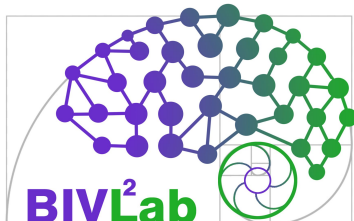
Data Uploading

- The best way to upload data is that you must be inside of UIS because is the direct network.
- You can use **FileZilla** for easy use or you can use scp:

```
scp [-r] [[user@]SRC_HOST:]file1 [[user@]DEST_HOST:]file2
```

Where the **-r** option is to copy recursively the folder o file that you want to send or receive.

Exist more options but that isn't our interest for now.



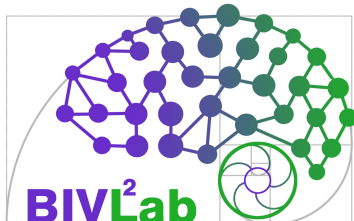
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How to use Docker

Basics

- First all the commands related to docker always start with: **docker**
- Docker have containers and images, the difference is like the so running and the iso of the so.
- Docker can create, start, stop, run (create & start together), remove, list containers, list images, execute, access to docker system, etc... We only cover the basics commands:
 - **docker create [options] {docker_image_name[:tag]} {command}**
 - **docker start {your_docker_container_name}**
 - **docker stop {your_docker_container_name}**
 - **docker run [options] {docker_image_name:tag} {command}**
 - **docker rm {your_docker_container_name}** (docker remove)
 - **docker exec [--user=x:x]-it {your_docker_container_name} {command}**

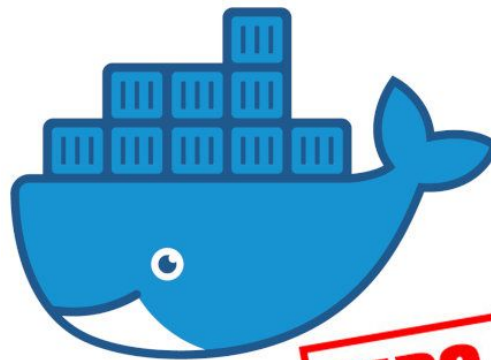


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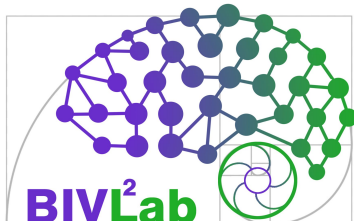


Basics

- **docker image ls** (list images)
- **docker ps** (list container running)
- **docker ps -a** (list all containers)
- Options for create and run:
 - **--volume=x:x (-v)**
 - **--workdir=x (-w)**
 - **--runtime=nvidia**
 - **--publish=x:x (-p)**
 - **--name="x"**
 - **--user=\$(id -u):\$(id -g)**
 - **--user=0:0**
 - **-it**



TIPS & TRICKS

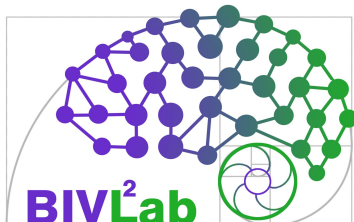


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Our Scripts

- If you see the options of create and run, if so boring and long to create our own docker, initializing, adding our user and all other thing so we create our own scripts that you can run simple:
 - **list_dockers** The same command to list images
 - **create_docker {image_name[:tag]} {your_docker_container_name} {port}** The beautiful command that every user can execute and its stored in /data/bin and bind user to your container, assign the name you want and let it run when finished.
 - **init_jupyter {your_docker_container_name} {port}** This command let you initialize the jupyter notebook in your container (We only use this command when is the first time that we use jupyter) (Obviously this command assumes that your container have jupyter installed)

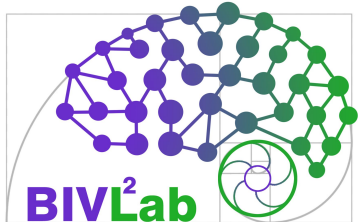


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Our Scripts

- `run_jupyter {your_docker_container_name} {port}` This scripts let you start your jupyter notebook in your container in the case when the server shutdown and you have to restart your container.



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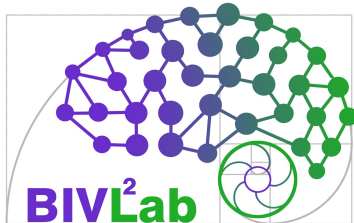


Access Container Terminal

- `docker exec -it {your_docker_container_name} /bin/bash`
To access container terminal as your user.
- `docker exec --user=0:0 -it {your_docker_container_name} /bin/bash` To access container terminal as root

IMPORTANT NOTES: The command `create_docker` ask you for password and add your username to sudo group. So you can access to container terminal with your user and change to root user. Finally always be aware of your terminal:

```
jefelitman@BIVL2ab-Titan-V:~$ jefelitman@b6a3bb0754f3:~$
```



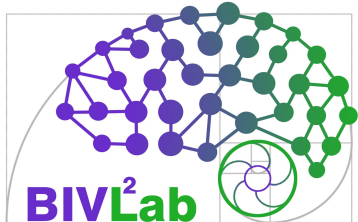
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Reminder

Questions?

Thank you for your attention!



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