EDGENET INTRODUCTION

In this section we will generate our own trace files to analyze. For that we will use the EdgeNet platform, as a client we will request a file from a distant server (see Fig.1, describing the platform architecture we will use).

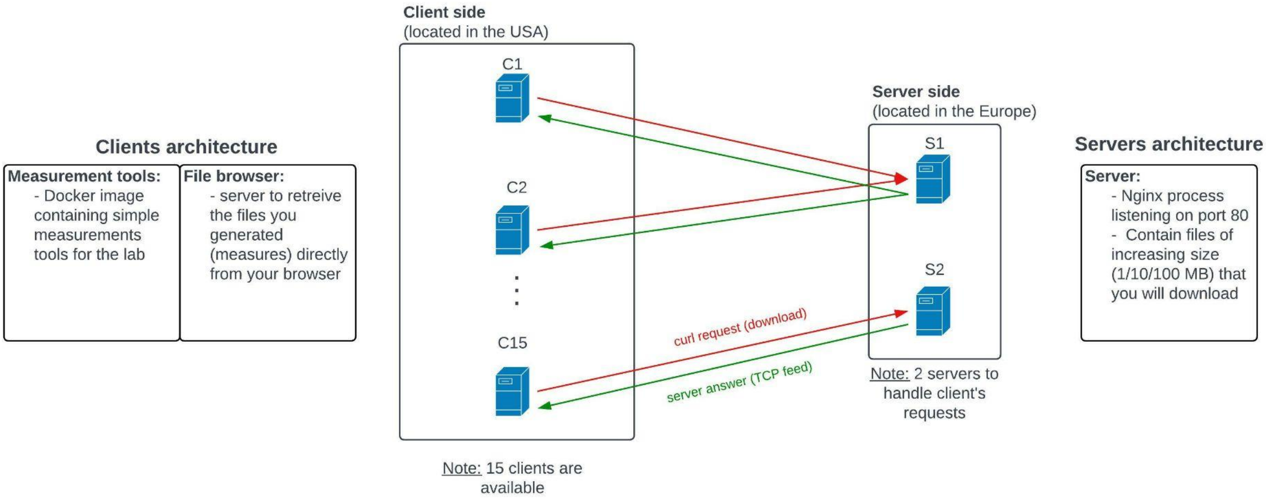
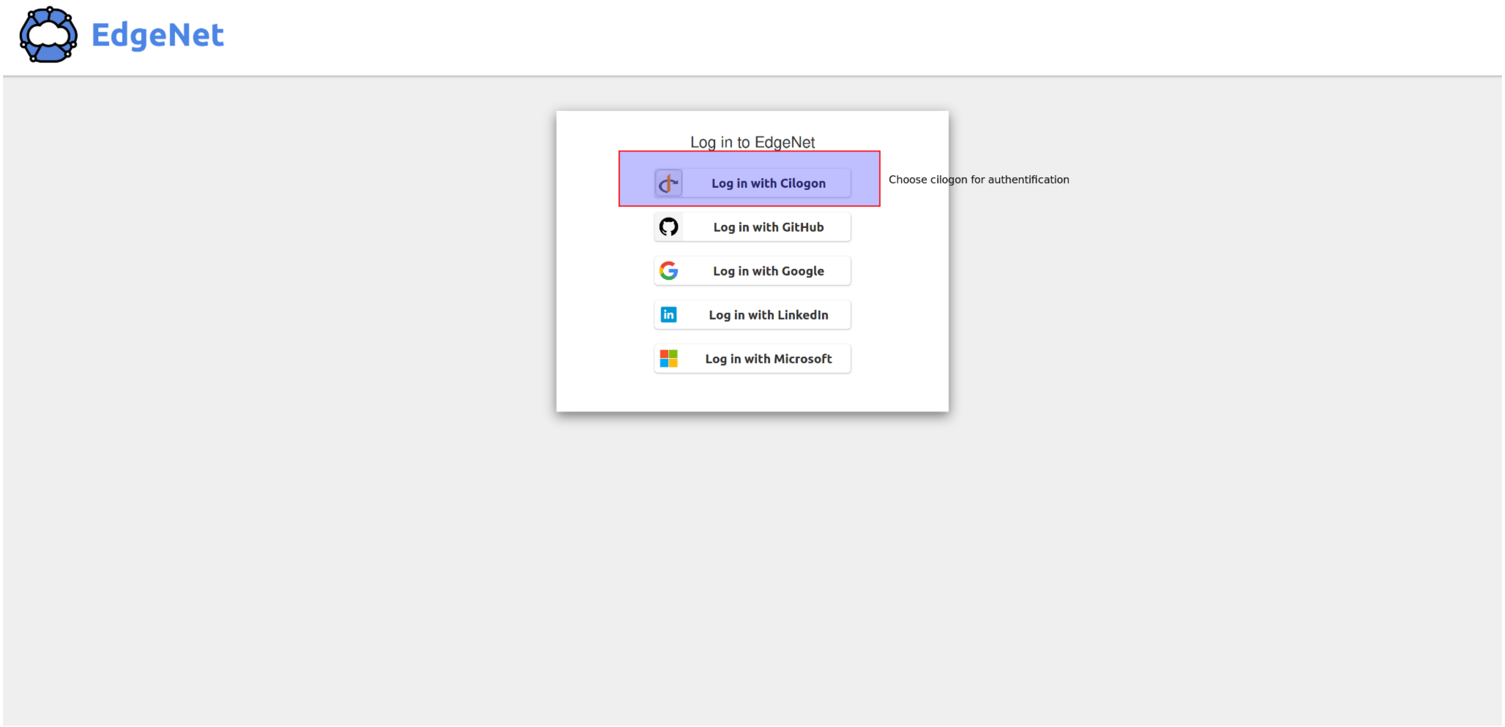

Client side
(located in the USA)
C1
C2
C15
Note: 15 clients are available
Server side
(located in the Europe)
S1
S2
Note: 2 servers to handle client's requests
curl request (download)
server answer (TCP feed)
Clients architecture
Measurement tools:
- Docker image containing simple measurements tools for the lab
File browser:
- server to retreive the files you generated (measures) directly from your browser
Servers architecture
Server:
- Nginx process listening on port 80
- Contain files of increasing size (1/10/100 MB) that you will download

Fig.1: EdgeNet infrastructure for client/server interaction. Clients are located in the U.S.A. while servers are in Europe. Clients request files from the server, initiating a TCP long distance process.

Processes to follow to **1) connect to EdgeNet** and **2) make your measures and retrieve them** are described in respectively section **I)** and **II)**.

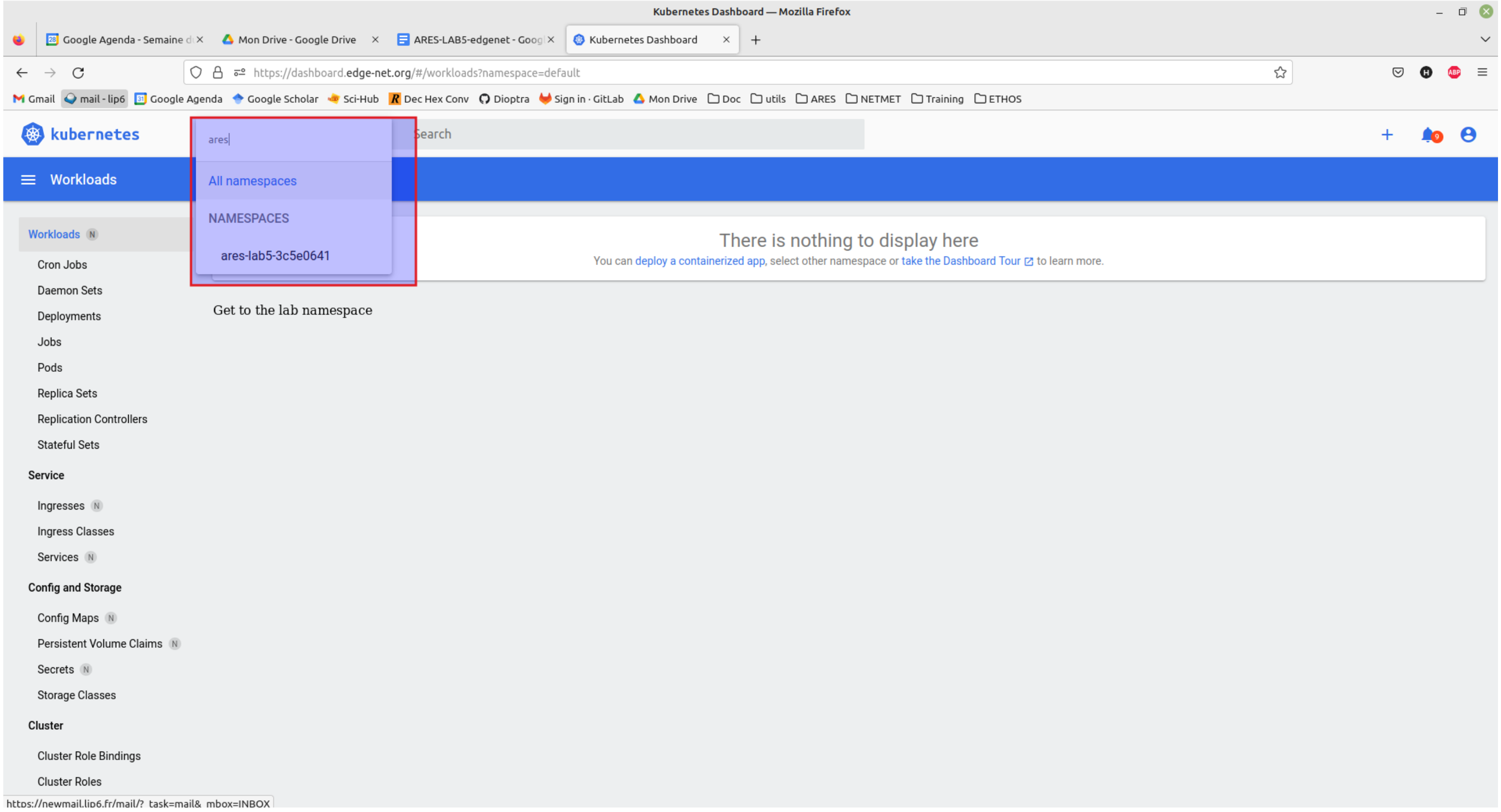
I. CONNECTION TO EDGENET

Got to dashboard.edge-net.org , Identification: choose “cilogon” and in the scrolling menu: choose “sorbonne university”, finally, enter your credentials



Choose cilogon for authentification

Go to ares-lab5-3c5e0641 edgenet namespace (where client machines are located)

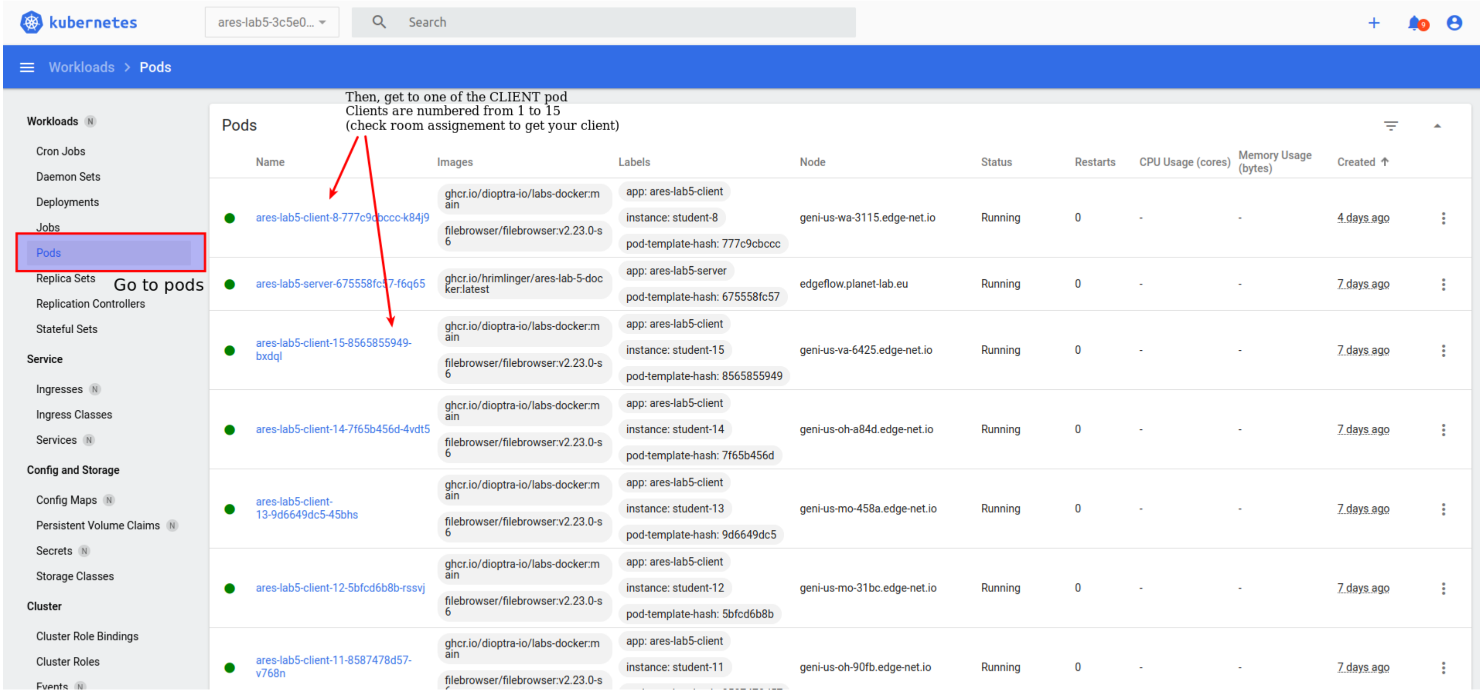


There is nothing to display here

You can deploy a containerized app, select other namespace or take the Dashboard Tour to learn more.

Get to the lab namespace

Get the pod interface within the namespace



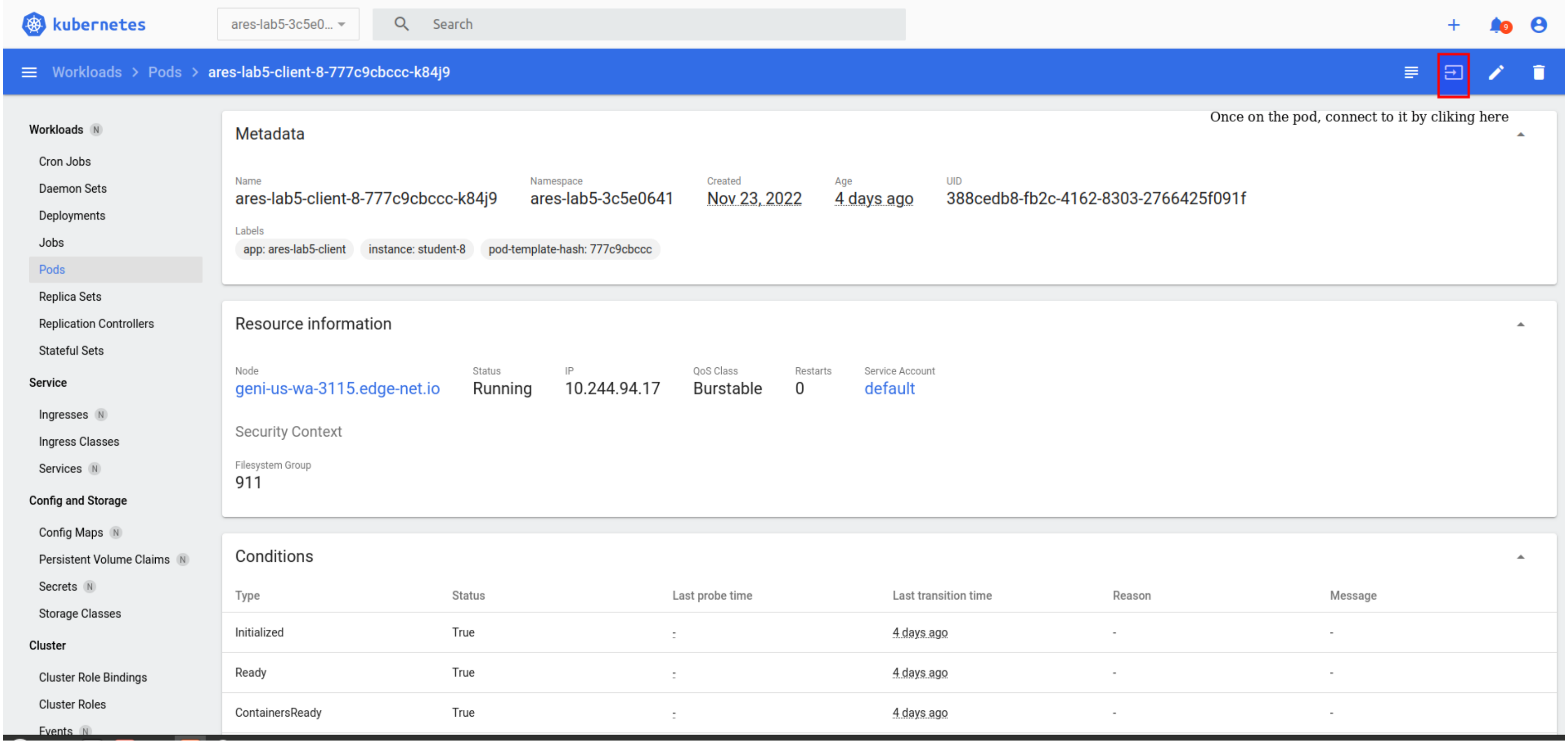
Go to pods

Then, get to one of the CLIENT pod
Clients are numbered from 1 to 15
(check room assignement to get your client)

Pods

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created ↑
● ares-lab5-client-8-777c9cbccc-k84j9	ghcr.io/dioptra-io/labs-docker:main filebrowser/filebrowser:v2.23.0-s6	app: ares-lab5-client instance: student-8 pod-template-hash: 777c9cbccc	geni-us-wa-3115.edge-net.io	Running	0	-	-	4 days ago
● ares-lab5-server-675558fc57-f6q65	ghcr.io/hrimlinger/ares-lab-5-docker:latest	app: ares-lab5-server pod-template-hash: 675558fc57	edgeflow.planet-lab.eu	Running	0	-	-	7 days ago
● ares-lab5-client-15-8565855949-bxdql	ghcr.io/dioptra-io/labs-docker:main filebrowser/filebrowser:v2.23.0-s6	app: ares-lab5-client instance: student-15 pod-template-hash: 8565855949	geni-us-va-6425.edge-net.io	Running	0	-	-	7 days ago
● ares-lab5-client-14-7f65b456d-4vdt5	ghcr.io/dioptra-io/labs-docker:main filebrowser/filebrowser:v2.23.0-s6	app: ares-lab5-client instance: student-14 pod-template-hash: 7f65b456d	geni-us-oh-a84d.edge-net.io	Running	0	-	-	7 days ago
● ares-lab5-client-13-9d6649dc5-45bhs	ghcr.io/dioptra-io/labs-docker:main filebrowser/filebrowser:v2.23.0-s6	app: ares-lab5-client instance: student-13 pod-template-hash: 9d6649dc5	geni-us-mo-458a.edge-net.io	Running	0	-	-	7 days ago
● ares-lab5-client-12-5bfcd6b8b-rssvj	ghcr.io/dioptra-io/labs-docker:main filebrowser/filebrowser:v2.23.0-s6	app: ares-lab5-client instance: student-12 pod-template-hash: 5bfcd6b8b	geni-us-mo-31bc.edge-net.io	Running	0	-	-	7 days ago
● ares-lab5-client-11-8587478d57-v768n	ghcr.io/dioptra-io/labs-docker:main filebrowser/filebrowser:v2.23.0-s	app: ares-lab5-client instance: student-11	geni-us-oh-90fb.edge-net.io	Running	0	-	-	7 days ago

Connect to a pod (number from 1 to 15)



Once on the pod, connect to it by cliking here

Metadata

Name: ares-lab5-client-8-777c9cbccc-k84j9
Namespace: ares-lab5-3c5e0641
Created: Nov 23, 2022
Age: 4 days ago
UID: 388cedb8-fb2c-4162-8303-2766425f091f

Labels: app: ares-lab5-client | instance: student-8 | pod-template-hash: 777c9cbccc

Resource information

Node: geni-us-wa-3115.edge-net.io
Status: Running
IP: 10.244.94.17
QoS Class: Burstable
Restarts: 0
Service Account: default

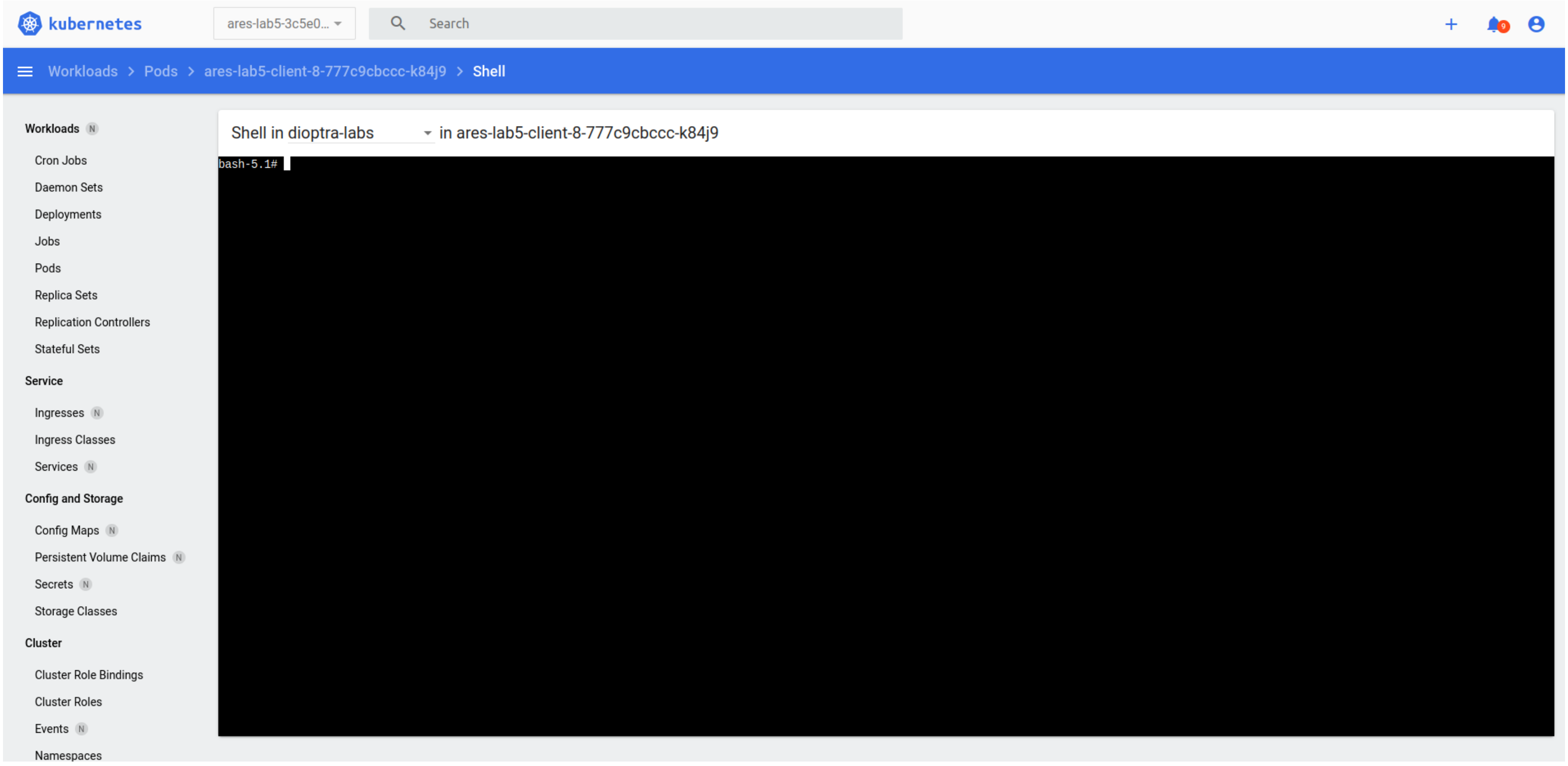
Security Context

Filesystem Group: 911

Conditions

Type	Status	Last probe time	Last transition time	Reason	Message
Initialized	True	-	4 days ago	-	-
Ready	True	-	4 days ago	-	-
ContainersReady	True	-	4 days ago	-	-

Now you are ready to make your own measurements!



Shell in dioptra-labs in ares-lab5-client-8-777c9cbccc-k84j9

```
bash-5.1#
```

II. MAKE YOUR OWN MEASUREMENTS

a) create your measurement file

Create the file where you can output your data:

- `touch ares-measurements/measure_1.pcap`

b) Start tcpdump in background

tcpdump is nothing more than a packet sniffer, equivalent to tshark (that you already used): start tcpdump in background so you can initiate the connection with the server afterward:

- `tcpdump -w ares-measurements/measure_1.pcap &`

Note: make sure that you are uploading your measurement files into the directory `ares-measurements/` so you can retrieve them afterwards and download them on your local machine.

c) Download the first file from the server with curl

Request the file 1MB.pcap contained on the server with curl:

-
  ```
  curl -L http://ares-lab5-server/traces/1MB_data -O --output-dir ares-measurements/
  ```

d) Stop Tcpdump process

get PID tcpdump process:

-
  ```
  ps -ax
  ```

Kill TCP dump process:

-
  ```
  kill SIGINT <tcp_dump_process_pid>
  ```

Note: replace <tcp_dump_process_pid> with the pid you got with last command)

e) Get other files from the server

The server contains several files you can download (located at the same directory). Repeat the execution of starting from tcpdump in background and replace the curl command with these new URL:

-
  ```
  curl -L http://ares-lab5-server/traces/10MB_data -O --output-dir ares-measurements/
  ```

-
  ```
  curl -L http://ares-lab5-server/traces/100MB_data -O --output-dir ares-measurements/
  ```

Note: Think about changing the name of the file for your measurements (so you do not replace your previous measures):

-
  ```
  tcpdump -w ares-measurements/measure_i.pcap &
  ```

f) Retrieve files on your local machine

Connect to the URL corresponding to your client:

1. https://**1**.ares-lab5.edge-net.org -> client 1
2. https://**2**.ares-lab5.edge-net.org -> client 2
3. https://**3**.ares-lab5.edge-net.org -> client 3
4. … -> until client 15

authentification:

- **login:** admin
- **password:** admin

g) Trace analysis

After downloading your measurement files, open wireshark and start analyzing your .pcap file (RTT, window size, etc.)

h) To go further

As you might become a network administrator in your future career, you might have to get information about the network state. You can have a glance of what that represents by running several tools used by network engineers to troubleshoot network issues.

i) ping

Get information about reachability and an estimation of the RTTt:

1. get server ip address: `curl http://ares-lab5-server` (this command will return the IP address of the server within the stdout)
2. `ping <server_ip_address>` (replace <server_ip_address> with the one you got with the previous command)

ii) traceroute

Get more insight about the path taken by an IP packet between your client and the server. Traceroute shows router's interfaces that were discovered on the route between your client and server:

- `traceroute <server_ip_address>`