

**DEPARTAMENTO DE ELECTRÓNICA, TELECOMUNICAÇÕES E INFORMÁTICA LICENCIATURA EM ENG. DE COMPUTADORES E INFORMÁTICA**

**ANO 2021/2022**

REDES DE COMUNICAÇÕES I

**GUIA PRÁTICO 1 – EXPERIÊNCIAS BASE**

# Objectives

* Verify the network configuration of a PC
* Name translation to IP addresses and vice-versa
* Connectivity tests
* Discovery of the path between two network machines
* Geo-location and discovery of the entity and responsible for the network machines

# Duration

1 class

# Verify the network configuration of a PC

1.1. Open a command window and execute the command *ipconfig* and register: (i) how many network interfaces (Linux: *ip link;* MAC: *ifconfig*) and (ii) the IP address and the *default gateway* of each interface (Linux: *ip addr* e *ip route;* MAC: *netstat -r*).

1.2. Repeat the command *ipconfi*g with the option */all* and register: (i) the name of the machine (Linux: *cat /etc/hostname*), (ii) the physical address of each interface (Linux: *ip addr*) and (iii) the DNS servers IP addresses (Linux: *cat*

*/etc/resolv.conf*).

1. **Name translation to IP addresses and vice-versa**

2.1. In a command window, using the command *nslookup* (same in Linux), determine the IP addresses associated to each of the following names:

|  |  |
| --- | --- |
| **Name** | **IP Address(es)** |
| [www.ua.pt](http://www.ua.pt/) | **193.136.173.58** |
| ua.pt | **193.136.172.175 / 193.136.172.174 / 193.136.172.173** |
| [www.tvi.iol.pt](http://www.tvi.iol.pt/) | **193.126.240.138** |
| [www.sapo.pt](http://www.sapo.pt/) | **213.13.146.142** |
| [www.tsf.pt](http://www.tsf.pt/) | **148.69.168.39 / 148.69.168.40 / 148.69.168.41 / 148.69.168.28** |
| [www.antena3.pt](http://www.antena3.pt/) | **94.46.160.176** |
| [www.rtp.pt](http://www.rtp.pt/) | **199.232.82.192** |
| [www.publico.pt](http://www.publico.pt/) | **99.86.119.2 / 99.86.119.7 / 99.86.119.93 / 99.86.119.113** |
| [www.google.com](http://www.google.com/) | **216.58.209.68** |
| [www.google.pt](http://www.google.pt/) | **142.250.184.163** |
| [www.google.es](http://www.google.es/) | **216.58.215.163** |
| [www.google.fr](http://www.google.fr/) | **142.250.200.99** |

nslookup [{address\_to\_find}]

2.2. Using the command *nslookup* determine the name associated to the following IP addresses:

|  |  |
| --- | --- |
| **IP Address** | **Name** |
| 193.136.173.58 | **lvs-ng.ua.pt** |
| 193.137.55.13 | **www.ua.pt** |
| 157.240.212.35 | **Edge-star-mini-shv-01-list1.facebook.com** |
| 31.13.66.174 | **Instagram-p42-shv-01-iad3.fbcdn.net** |

2.3. Open the browser and access to each of the following URLs:

|  |
| --- |
| **Addresses** |
| 193.137.55.13 |

157.240.212.35

# Connectivity tests

3.1. In a command window execute the command *ping* (same in Linux) to the following addresses, and register the average round trip time. What can you conclude about the relation between the round trip time and the geographical distance? Note: If pings do not work, connect through the WiFi network in the lab.

|  |  |  |
| --- | --- | --- |
| **Addresses** | **Machine location** | **gaAverage round trip time** |
| [www.ua.pt](http://www.ua.pt/) | Aveiro, Portugal (0Km) | **9 ms** |
| [www.up.pt](http://www.up.pt/) | Porto, Portugal (~60Km) | **10 ms** |
| [www.fc.ul.pt](http://www.fc.ul.pt/) | Lisboa, Portugal (~220Km) | **11 ms** |
| [www.utad.pt](http://www.utad.pt/) | Vila Real, Portugal (~160Km) | **Timed out** |
| [www.uevora.pt](http://www.uevora.pt/) | Évora, Portugal (~250Km) | **15 ms** |
| [www.uam.es](http://www.uam.es/) | Madrid, Espanha (~420Km) | **40 ms** |
| [www.univ-paris8.fr](http://www.univ-paris8.fr/) | Paris, França (~1260Km) | **Timed out** |
| web.mit.edu | EUA (~5100Km) | **19 ms** |
| [www.zju.edu.cn](http://www.zju.edu.cn/) | China (~7200Km) | **94 ms** |
| [www.unisa.ac.za](http://www.unisa.ac.za/) | África do Sul (~8750Km) | **Timed out** |
| [www.adelaide.edu.au](http://www.adelaide.edu.au/) | Austrália (~17100Km) | **291 ms** |
| tanzania-telecom.com | Tanzânia (~3100Km) | **Timed out** |

1. **Discovery of the path between two network machines**

4.1. In a command window execute the command *tracert* (Linux: *traceroute*) to the following addresses, and register the number of network machines between the origin and destination, and the address of the antepenultimate machine in the path. Repeat using the option *–d* of the *tracert* command.

|  |  |  |  |
| --- | --- | --- | --- |
| **Addresses** | **Machine location** | **Number of machines** | **IP address of the antepenultimate machine in the path** |
| [www.ua.pt](http://www.ua.pt/) | Aveiro, Portugal (0Km) | **5** | **10.1.0.101** |
| [www.up.pt](http://www.up.pt/) | Porto, Portugal (~60Km) | **10** | **194.210.6.105** |
| [www.fc.ul.pt](http://www.fc.ul.pt/) | Lisboa, Portugal (~220Km) | **11** | **193.137.1.18** |
| [www.utad.pt](http://www.utad.pt/) | Vila Real, Portugal (~160Km) | **6** | **193.137.173.244** |
| [www.uevora.pt](http://www.uevora.pt/) | Évora, Portugal (~250Km) | **11** | **193.136.1.18** |
| [www.uam.es](http://www.uam.es/) | Madrid, Espanha (~420Km) | **13** | **130.206.216.2** |
| [www.univ-paris8.fr](http://www.univ-paris8.fr/) | Paris, França (~1260Km) | **16** | **62.40.124.70** |
| web.mit.edu | EUA (~5100Km) | **11** | **83.97.88.209** |
| [www.zju.edu.cn](http://www.zju.edu.cn/) | China (~7200Km) | **18** | **195.22.208.79** |
| [www.unisa.ac.za](http://www.unisa.ac.za/) | África do Sul (~8750Km) | **21** | **155.232.1.97** |
| [www.adelaide.edu.au](http://www.adelaide.edu.au/) | Austrália (~17100Km) | **19** | **113.197.15.38** |
| tanzania-telecom.com | Guiné Bissau (~3100Km) | **18** | **130.117.14.38** |

# Discovery of the entity and responsible for the network machines

5.1. Using the service *whois,* through the web page https://who.is/ (or https://ping.eu/ns- whois/), determine (if possible), for each of the *trace routes* in 4.1: the entity responsible by the **antepenultimate** machine of each path and the location of that entity.

|  |  |  |
| --- | --- | --- |
| **IP address** | **Responsible entity** | **Location of the entity** |
| **10.1.0.101** | **Internet Assigned Numbers Authority (IANA)** | **Los Angeles** |
| **194.210.6.105** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **193.137.1.18** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **193.137.173.244** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **193.136.1.18** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **130.206.216.2** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **62.40.124.70** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **83.97.88.209** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **195.22.208.79** | **RIPE Network Coordination Centre (RIPE)** | **Amsterdam** |
| **155.232.1.97** | **African Network Information Center (AFRINIC)** | **Ebene** |
| **113.197.15.38** | **Asia Pacific Network Information Centre (APNIC)** | **South Brisbane** |
| **130.117.14.38** | **PSINet, Inc. (PSI)** | **Washington** |

1. **Geo-location of IP addresses**

6.1. Using the geo-location service, through the web page [http://www.hostip.info](http://www.hostip.info/), determine for each of the *trace routes* in 5, the geographic location of the **antepenultimate** machine of each path. Note: this service is not precise.

|  |  |  |
| --- | --- | --- |
| **Addresses** | **Location**  **C Country City** | |
| **Country** | **City** |
| **10.1.0.101** |  |  |
| **194.210.6.105** | Portugal |  |
| **193.137.1.18** | Portugal | Lisboa |
| **193.137.173.244** | Portugal | Aveiro |
| **193.136.1.18** | Portugal | Lisboa |
| **130.206.216.2** | União Europeia |  |
| **62.40.124.70** | União Europeia |  |
| **83.97.88.209** | Reino Unido |  |
| **195.22.208.79** | Itália | **Machida** |
| **155.232.1.97** | África do Sul |  |
| **113.197.15.38** | No idea |  |
| **130.117.14.38** | Estados Unidos |  |