



universidade de aveiro  
theoria poiesis praxis

**DEPARTAMENTO DE ELECTRÓNICA, TELECOMUNICAÇÕES E INFORMÁTICA**  
**LICENCIATURA EM ENG. DE COMPUTADORES E INFORMÁTICA**  
**ANO 2022/2023**

## **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

## 1. 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 *ipconfig* 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*).

## 2. 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)
<a href="http://www.ua.pt">www.ua.pt</a>	193.136.173.58
<a href="http://ua.pt">ua.pt</a>	193.136.172.174----193.136.172.173----193.136.172.175
<a href="http://www.tvi.iol.pt">www.tvi.iol.pt</a>	193.126.240.138
<a href="http://www.sapo.pt">www.sapo.pt</a>	213.13.146.142
<a href="http://www.tsf.pt">www.tsf.pt</a>	148.69.168.40----148.69.168.41----148.69.168.38----148.69.168.39
<a href="http://www.antena3.pt">www.antena3.pt</a>	94.46.160.176
<a href="http://www.rtp.pt">www.rtp.pt</a>	151.101.134.192
<a href="http://www.publico.pt">www.publico.pt</a>	18.161.97.16----18.161.97.13----18.161.97.116----18.161.97.58
<a href="http://www.google.com">www.google.com</a>	2a00:1450:4003:80c::2004----142.250.184.164
<a href="http://www.google.pt">www.google.pt</a>	2a00:1450:4003:80c::2003----142.250.184.163
<a href="http://www.google.es">www.google.es</a>	2a00:1450:4003:806::2003----216.58.215.163
<a href="http://www.google.fr">www.google.fr</a>	2a00:1450:4003:80e::2003----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.up.pt
157.240.212.35	edge-star-mini-shv-01-lis1.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

### 3. 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	Average round trip time
<a href="http://www.ua.pt">www.ua.pt</a>	Aveiro, Portugal (0Km)	7ms
<a href="http://www.up.pt">www.up.pt</a>	Porto, Portugal (~60Km)	11ms
<a href="http://www.fc.ul.pt">www.fc.ul.pt</a>	Lisboa, Portugal (~220Km)	13ms
<a href="http://www.utad.pt">www.utad.pt</a>	Vila Real, Portugal (~160Km)	----
<a href="http://www.uevora.pt">www.uevora.pt</a>	Évora, Portugal (~250Km)	77ms
<a href="http://www.uam.es">www.uam.es</a>	Madrid, Espanha (~420Km)	483ms
<a href="http://www.univ-paris8.fr">www.univ-paris8.fr</a>	Paris, França (~1260Km)	----
<a href="http://web.mit.edu">web.mit.edu</a>	EUA (~5100Km)	331ms
<a href="http://www.zju.edu.cn">www.zju.edu.cn</a>	China (~7200Km)	381ms
<a href="http://www.unisa.ac.za">www.unisa.ac.za</a>	África do Sul (~8750Km)	512ms
<a href="http://www.adelaide.edu.au">www.adelaide.edu.au</a>	Austrália (~17100Km)	427ms
<a href="http://tanzania-telecom.com">tanzania-telecom.com</a>	Tanzânia (~3100Km)	----

### 4. 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
<a href="http://www.ua.pt">www.ua.pt</a>	Aveiro, Portugal (0Km)	5	10.1.0.101
<a href="http://www.up.pt">www.up.pt</a>	Porto, Portugal (~60Km)	11	194.210.6.205
<a href="http://www.fc.ul.pt">www.fc.ul.pt</a>	Lisboa, Portugal (~220Km)	12	193.137.1.18
<a href="http://www.utad.pt">www.utad.pt</a>	Vila Real, Portugal (~160Km)	----	----
<a href="http://www.uevora.pt">www.uevora.pt</a>	Évora, Portugal (~250Km)	13	193.137.219.82
<a href="http://www.uam.es">www.uam.es</a>	Madrid, Espanha (~420Km)	16	150.244.214.237
<a href="http://www.univ-paris8.fr">www.univ-paris8.fr</a>	Paris, França (~1260Km)	----	----
<a href="http://web.mit.edu">web.mit.edu</a>	EUA (~5100Km)	13	62.40.98.97
<a href="http://www.zju.edu.cn">www.zju.edu.cn</a>	China (~7200Km)	20	62.115.179.78
<a href="http://www.unisa.ac.za">www.unisa.ac.za</a>	África do Sul (~8750Km)	22	155.232.1.97
<a href="http://www.adelaide.edu.au">www.adelaide.edu.au</a>	Austrália (~17100Km)	23	----
<a href="http://www.gtelecom.gw">www.gtelecom.gw</a>	Guiné Bissau (~3100Km)	----	----

## 5. 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	Los Angeles
194.210.6.205	RIPE Network Coordination Centre	Amsterdam
193.137.1.18	RIPE Network Coordination Centre	Amsterdam
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193.137.219.82	RIPE Network Coordination Centre	Amsterdam
150.244.214.237	Asia Pacific NIC	South Brisbane
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62.40.98.97	RIPE Network Coordination Centre	Amsterdam
62.115.179.78	RIPE Network Coordination Centre	Amsterdam
155.232.1.97	African Network Information Center	Ebene
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## 6. Geo-location of IP addresses

6.1. Using the geo-location service, through the web page <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	
	Country	City
10.1.0.101	Private block address	Private block address
194.210.6.205	PORTUGAL	----
193.137.1.18	PORTUGAL	Lisboa
----	----	----
193.137.219.82	PORTUGAL	Évora
150.244.214.237	EUROPEAN UNION	----
----	----	----
62.40.98.97	EUROPEAN UNION	----
62.115.179.78	UNITED KINGDOM	----
155.232.1.97	SOUTH AFRICA	----
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