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

## **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* and *ip route*; MAC: *netstat -r*).

1.2. Repeat the command *ipconfig* with the option */all* (“*ipconfig /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
ua.pt	193.136.172.173, 193.136.172.174, 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>	148.69.168.38, 148.69.168.39, 148.69.168.40, 148.69.168.41
<a href="http://www.antena3.pt">www.antena3.pt</a>	94.46.160.176
<a href="http://www.rtp.pt">www.rtp.pt</a>	146.75.90.192
<a href="http://www.publico.pt">www.publico.pt</a>	108.157.98.113, 108.157.98.97, 108.157.98.54, 108.157.98.35
<a href="http://www.google.com">www.google.com</a>	216.58.215.164, 2a00:1450:4003:806::2004
<a href="http://www.google.pt">www.google.pt</a>	216.58.215.163, 2a00:1450:4003:806::2003
<a href="http://www.google.es">www.google.es</a>	142.250.200.99, 2a00:1450:4003:80e::2003
<a href="http://www.google.fr">www.google.fr</a>	142.250.184.163, 2a00:1450:4003:80c::2003

```
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
157.240.212.35

### 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)	4.355ms
www.up.pt	Porto, Portugal (~60Km)	11.390ms
<a href="http://www.fc.ul.pt">www.fc.ul.pt</a>	Lisboa, Portugal (~220Km)	N/A
<a href="http://www.utad.pt">www.utad.pt</a>	Vila Real, Portugal (~160Km)	5.201ms
<a href="http://www.uevora.pt">www.uevora.pt</a>	Évora, Portugal (~250Km)	12.302ms
<a href="http://www.uam.es">www.uam.es</a>	Madrid, Espanha (~420Km)	27.208ms
www.univ-paris8.fr	Paris, França (~1260Km)	N/A
web.mit.edu	EUA (~5100Km)	45.779ms
www.unisa.ac.za	África do Sul (~8750Km)	227.560ms
www.adelaide.edu.au	Austrália (~17100Km)	293.018ms
www.tanzaniatourism.go.tz	Tanzânia (~3100Km)	N/A

### 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)	3	193.136.82.252
www.up.pt	Porto, Portugal (~60Km)	11	194.210.6.105
www.fc.ul.pt	Lisboa, Portugal (~220Km)	10	193.136.1.8
www.utad.pt	Vila Real, Portugal (~160Km)	7	193.137.173.244
www.uevora.pt	Évora, Portugal (~250Km)	10	193.136.1.10
<a href="http://www.uam.es">www.uam.es</a>	Madrid, Espanha (~420Km)	14	130.206.216.2
www.univ-paris8.fr	Paris, França (~1260Km)	15	193.51.177.109
web.mit.edu	EUA (~5100Km)	9	83.97.88.209
www.unisa.ac.za	África do Sul (~8750Km)	17	155.232.1.163
www.adelaide.edu.au	Austrália (~17100Km)	15	113.197.15.44
jornalnopintcha.gw	Guiné Bissau (~3100Km)	16	212.3.235.26

## 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
193.136.82.252	RIPE Network Coordination Centre (RIPE)	Amsterdam
194.210.6.105	RIPE Network Coordination Centre (RIPE)	Amsterdam
193.136.1.8	RIPE Network Coordination Centre (RIPE)	Amsterdam
193.137.173.244	RIPE Network Coordination Centre (RIPE)	Amsterdam
193.136.1.10	RIPE Network Coordination Centre (RIPE)	Amsterdam
130.206.216.2	RIPE Network Coordination Centre (RIPE)	Amsterdam
193.51.177.109	RIPE Network Coordination Centre (RIPE)	Amsterdam
83.97.88.209	RIPE Network Coordination Centre (RIPE)	Amsterdam
155.232.1.163	African Network Information Center (AFRINIC)	Ebene
113.197.15.44	Asia Pacific Network Information Centre (APNIC)	South Brisbane
212.3.235.26	RIPE Network Coordination Centre (RIPE)	Amsterdam

## 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
193.136.82.252	PORTUGAL	Aveiro
194.210.6.105	PORTUGAL	Lisbon
193.136.1.8	PORTUGAL	Lisbon
193.137.173.244	PORTUGAL	Aveiro
193.136.1.10	PORTUGAL	Lisbon
130.206.216.2	EUROPEAN UNION	
193.51.177.109	FRANCE	
83.97.88.209	UNITED KINGDOM	
155.232.1.163	SOUTH AFRICA	
113.197.15.44	Australia	
212.3.235.26	BELGIUM	