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)
www.ua.pt	193.136.173.58
ua.pt	193.136.172.173 - 193.136.172.175 - 193.136.172.174
www.tvi.iol.pt	193.126.240.138
www.sapo.pt	213.13.146.142
www.tsf.pt	148.69.168.38 - 148.69.168.41 - 148.69.168.40 - 148.69.168.39
www.antena3.pt	94.46.160.176
www.rtp.pt	146.75.90.192
www.publico.pt	108.157.98.97 - 108.157.98.113 - 108.157.98.35 - 108.157.98.54
www.google.com	2a00:1450:4003:806::2004 - 216.58.215.164
www.google.pt	216.58.215.163
www.google.es	142.250.200.99
www.google.fr	142.250.184.163

```
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	www.up.pt
157.240.212.35	edge-star-mini-shv-01-lis1.facebook.com

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
www.ua.pt	Aveiro, Portugal (0Km)	Media = 10ms
www.up.pt	Porto, Portugal (~60Km)	16ms
www.fc.ul.pt	Lisboa, Portugal (~220Km)	timed out
www.utad.pt	Vila Real, Portugal (~160Km)	9ms
www.uevora.pt	Évora, Portugal (~250Km)	55ms
www.uam.es	Madrid, Espanha (~420Km)	32 ms
www.univ-paris8.fr	Paris, França (~1260Km)	timed out
web.mit.edu	EUA (~5100Km)	24ms
www.unisa.ac.za	África do Sul (~8750Km)	338ms
www.adelaide.edu.au	Austrália (~17100Km)	296ms
www.tanzaniatourism.go.tz	Tanzânia (~3100Km)	timed out

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
www.ua.pt	Aveiro, Portugal (0Km)	5	10.1.0.101
www.up.pt	Porto, Portugal (~60Km)	11	[194.210.6.105]
www.fc.ul.pt	Lisboa, Portugal (~220Km)	+10	timed out
www.utad.pt	Vila Real, Portugal (~160Km)	8	[193.136.4.26]
www.uevora.pt	Évora, Portugal (~250Km)	13	193.137.219.82
www.uam.es	Madrid, Espanha (~420Km)	16	[193.145.14.30]
www.univ-paris8.fr	Paris, França (~1260Km)	+17	62.40.124.70
web.mit.edu	EUA (~5100Km)	13	[62.40.98.97]
www.unisa.ac.za	África do Sul (~8750Km)	21	155.232.1.97
www.adelaide.edu.au	Austrália (~17100Km)	24	timed out
jornalnopintcha.gw	Guiné Bissau (~3100Km)	20	timed out, antes desse foi 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
10.1.0.101	Internet Assigned Numbers Authority	Los Angeles
194.210.6.105	RIPE Network Coordination Centre	Amsterdam
[193.136.4.26]	RIPE Network Coordination Centre	Amsterdam
193.137.219.82	RIPE Network Coordination Centre	Amsterdam
193.145.14.30	RIPE Network Coordination Centre	Amsterdam
62.40.124.70	RIPE	Amsterdam
[62.40.98.97]	RIPE Network Coordination Centre	Amsterdam
155.232.1.97	RIPE Network Coordination Centre	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
10.1.0.101	Private block address.	
194.210.6.105	PORTUGAL	---
[193.136.4.26]	PORTUGAL	Porto
193.137.219.82	PORTUGAL	Evora
193.145.14.30	SPAIN	Huddinge
62.40.124.70	EUROPEAN UNION	
62.40.98.97	EUROPEAN UNION	
155.232.1.97	SOUTH AFRICA	