

Computer Networks

0. Presentation

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Table of contents

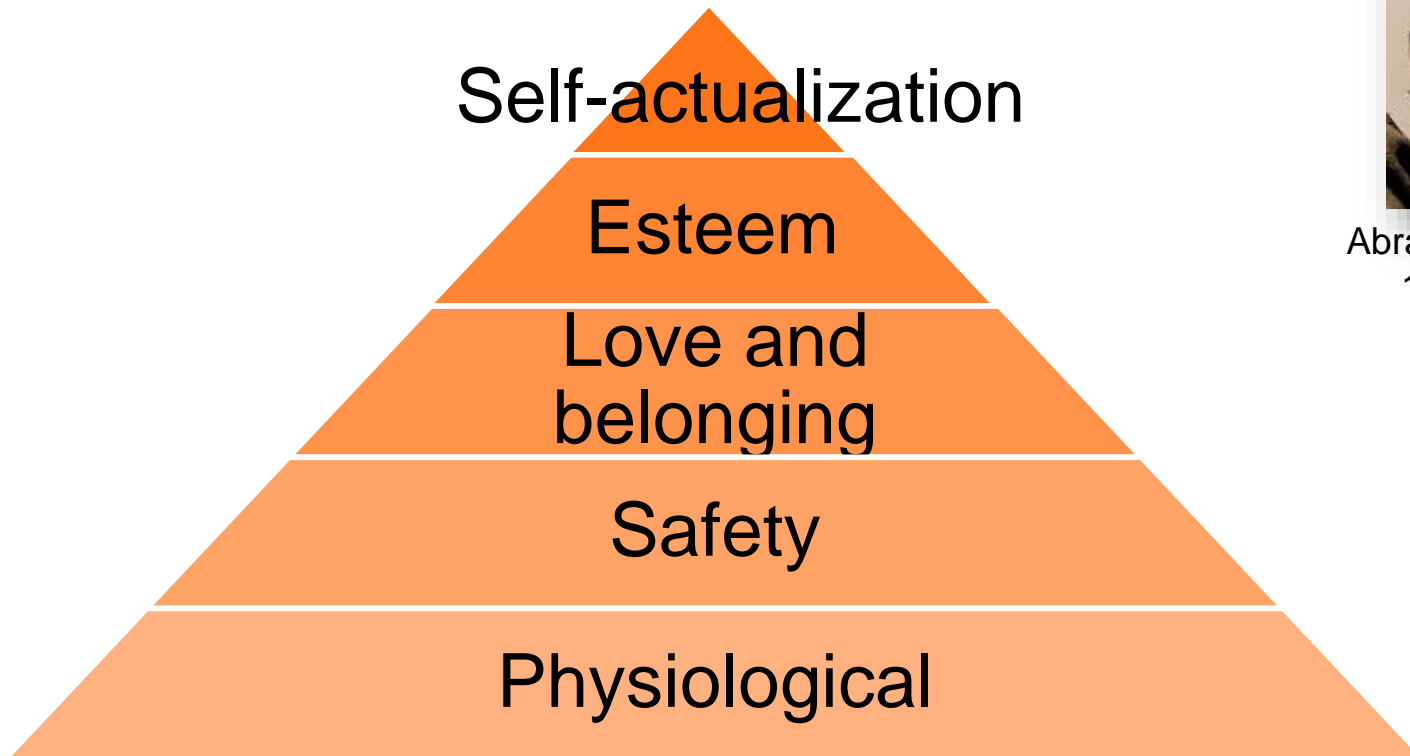
1. Introduction
2. Objective
3. Contents
4. Methodology
5. Evaluation
6. Bibliography
7. Final remarks

1. Introduction

- Name: **Computer Networks**
- Grade: Biomedical Engineering
- Teaching period: 2^o, 1Q
- Type: Mandatory
- Credits: 6 ECTS
- Language: English
- Professor: Boni García (boni.garcia@urjc.es)
- Classroom: Laboratory 1.106 (Alcorcón Campus)

2. Objective

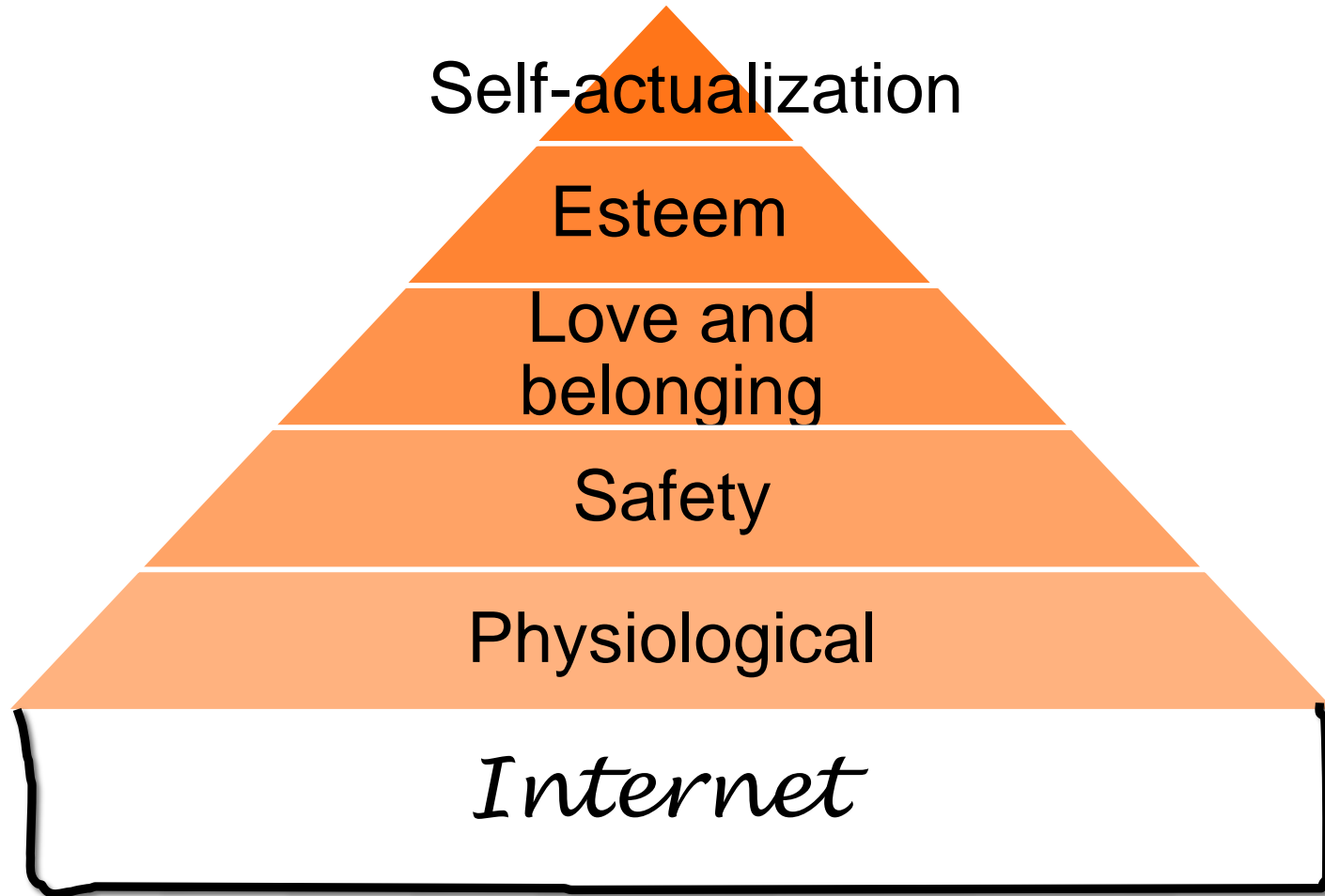
- The Maslow Pyramid:



Abraham Maslow
1908-1970

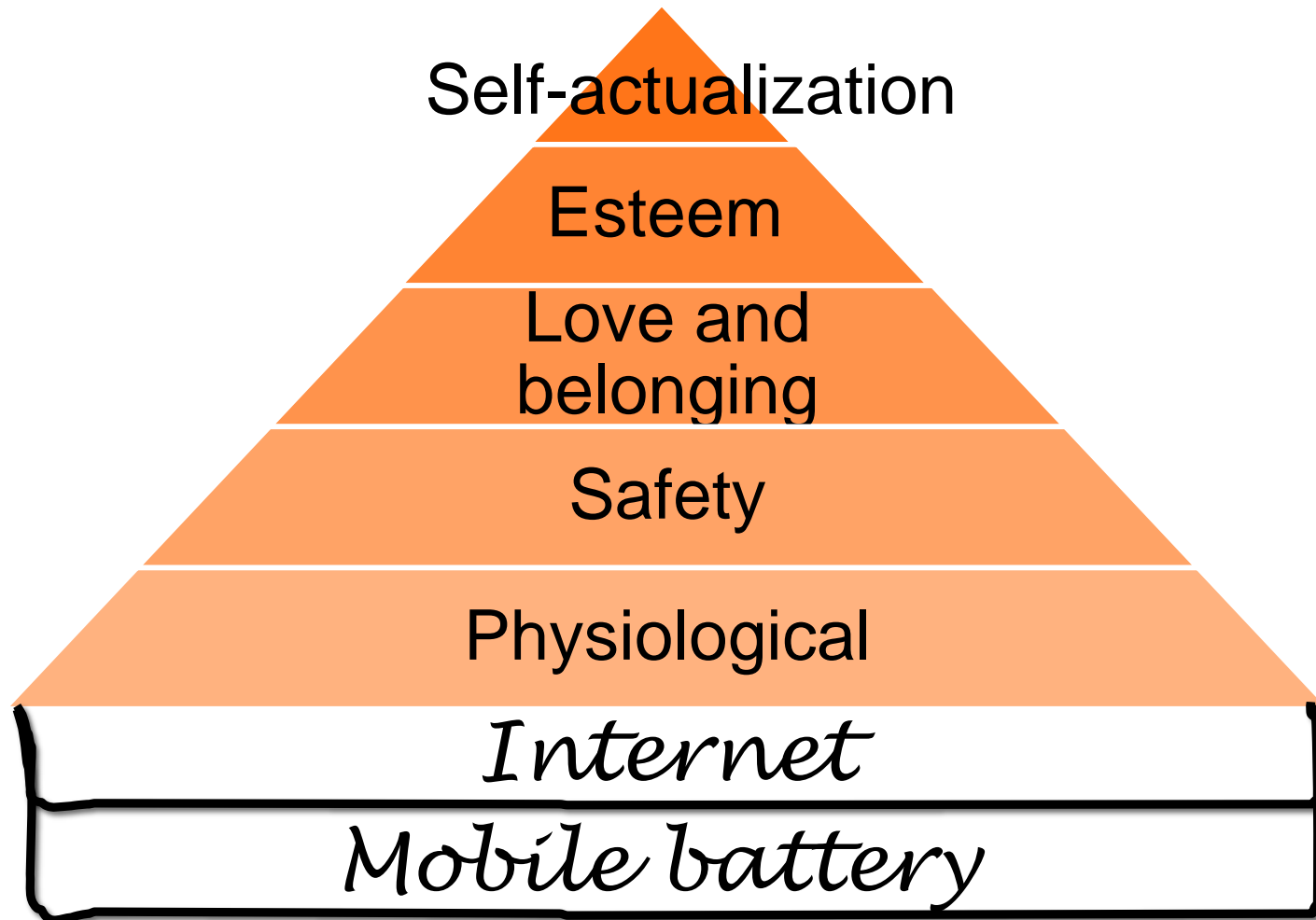
2. Objective

- The Maslow Pyramid 2.0:



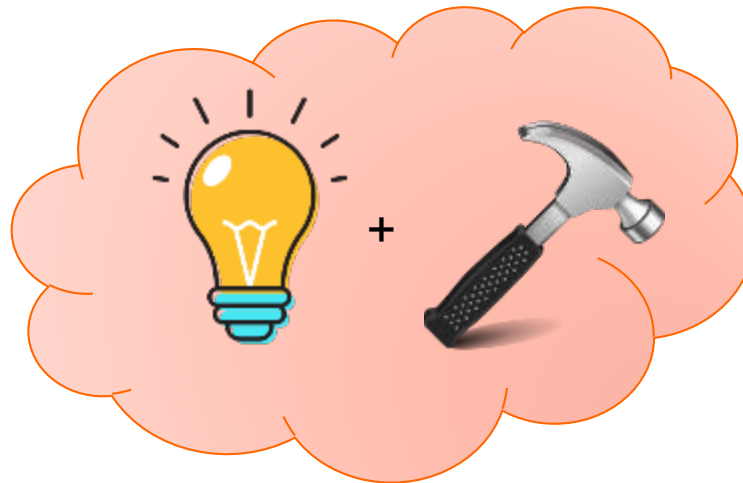
2. Objective

- The Maslow Pyramid 2.1:



2. Objective

- The main objectives of this course is to understand how **computer networks** (based on the **Internet** model) works:
 1. To learn the theory behind the Internet model
 2. To practice about protocol analysis and network diagnostics



2. Objective

1. To learn the theory behind the Internet model

Application

Transport

Network

Link

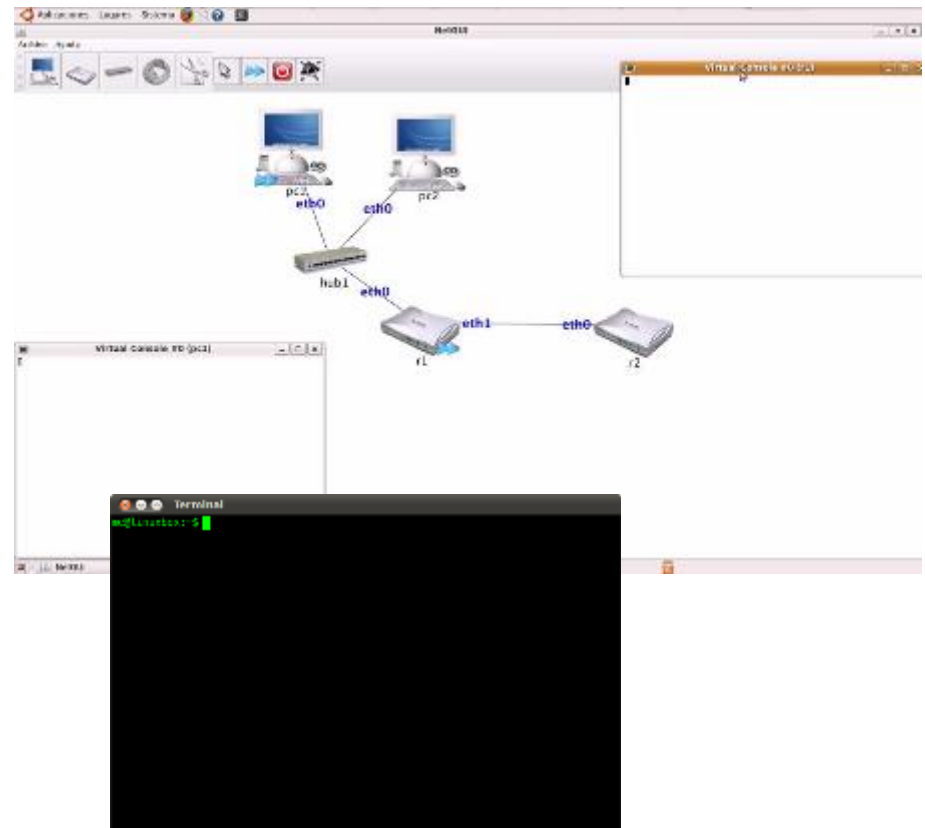
Physical

2. Objective

2. To practice about protocol analysis and network diagnostics

The image shows the Wireshark interface with a packet capture list and a detailed view of a selected packet. The packet list shows various protocols like TCP, UDP, and ICMP. The detailed view shows the raw bytes and their hexadecimal representation.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.1.101	192.168.1.102	ICMP	60	8 [type 8] echo (ping) 192.168.1.102
2	0.000000	192.168.1.102	192.168.1.101	ICMP	60	8 [type 0] echo reply (ping) 192.168.1.101
3	0.000000	192.168.1.101	192.168.1.102	TCP	60	55500->55512 [ACK] seq=651406141
4	0.000000	192.168.1.102	192.168.1.101	TCP	60	55500->55512 [ACK] seq=651406141
5	0.000000	192.168.1.101	192.168.1.102	UDP	54	source port: 55582 destination port: 55582
6	0.000000	192.168.1.102	192.168.1.101	UDP	54	source port: 55582 destination port: 55582
7	0.000000	192.168.1.101	192.168.1.102	UDP	54	source port: 55582 destination port: 55582
8	0.000000	192.168.1.102	192.168.1.101	UDP	54	source port: 55582 destination port: 55582
9	0.000000	192.168.1.101	192.168.1.102	ICMP	60	8 [type 8] echo (ping) 192.168.1.102
10	0.000000	192.168.1.102	192.168.1.101	ICMP	60	8 [type 0] echo reply (ping) 192.168.1.101
11	0.000000	192.168.1.101	192.168.1.102	TCP	60	55500->55512 [ACK] seq=651406141
12	0.000000	192.168.1.102	192.168.1.101	TCP	60	55500->55512 [ACK] seq=651406141
13	0.000000	192.168.1.101	192.168.1.102	UDP	54	source port: 55582 destination port: 55582
14	0.000000	192.168.1.102	192.168.1.101	UDP	54	source port: 55582 destination port: 55582
15	0.000000	192.168.1.101	192.168.1.102	ICMP	60	8 [type 8] echo (ping) 192.168.1.102
16	0.000000	192.168.1.102	192.168.1.101	ICMP	60	8 [type 0] echo reply (ping) 192.168.1.101
17	0.000000	192.168.1.101	192.168.1.102	TCP	60	55500->55512 [ACK] seq=651406141
18	0.000000	192.168.1.102	192.168.1.101	TCP	60	55500->55512 [ACK] seq=651406141
19	0.000000	192.168.1.101	192.168.1.102	UDP	54	source port: 55582 destination port: 55582
20	0.000000	192.168.1.102	192.168.1.101	UDP	54	source port: 55582 destination port: 55582



WIRESHARK

3. Contents

Part I

1. Introduction to computer networks
2. Link layer
3. Network layer



Mid-term #1

Part II

5. Transport layer
6. Application layer



Mid-term #2

4. Methodology

- There will be two types of classes: theory and practice
- The theory is aimed to explain the concepts required to understand the underlying technology
- There is an strong focus on the practice (learn by doing approach)



5. Evaluation

- Ordinary/extraordinary evaluation:
 1. Mandatory delivery of practices: 10%
 2. Mid term exam #1: 45%
 3. Mid term exam #2: 45%
- Requirement: Minimum score of 4.0 in each exam

6. Bibliography

- TCP/IP illustrated, 2nd ed. Kevin R. Fall, Richard W. Stevens Addison-Wesley, 2012
- Computer networks: top-down approach, 5th ed. James F. Kurose Pearson Addison-Wesley, 2017
- Computer networks 5th ed. Andrew S. Tanenbaum and David J. Wetherall. Pearson, 2010
- Computer networks: a systems approach, 4th ed. Larry L. Peterson Elsevier, 2007

7. Final remarks

- ***Ambition, the film***
 - European Space Agency (ESA), 24 de octubre de 2014



7. Final remarks

- What can we learn from this short film?
 - Perseverance in learning (try and try again)
 - Learn from our mistakes
 - Learn >> pass