Redes II

Universidade do Algarve

Aulas Teóricas

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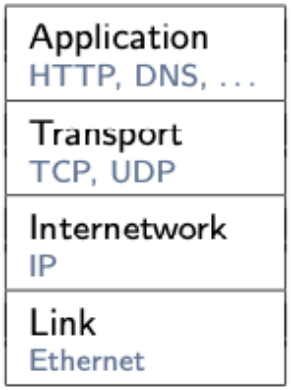
Redes de Computadores II

Mas no que consiste esta cadeira?

Full version at https://github.com/ncatanoc/redes_algarve/blob/main/syllabus.md

- Compreender os serviços das camadas protocolares (protocol layers)
- Comprender o endereçamento de rede.
- Conhecer as principais vertentes da segurança em redes de computadores e as principais vulnerabilidades e tipos de ameaças.

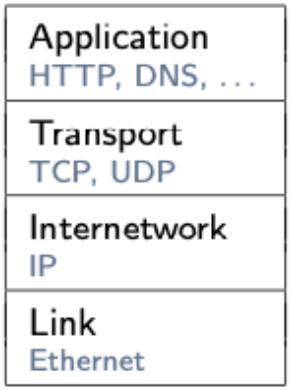


Redes de Computadores II

Mas no que consiste esta cadeira?

Full version at https://github.com/ncatanoc/redes_algarve/blob/main/syllabus.md

- Compreender as diferenças e o funcionamento das arquitecturas de rede ao nível da camada de aplicação
- Compreender o endereçamento IPv4 e IPv6.
- Compreender diferentes tipos de tecnologias de redes, nomeadamente, Wi-Fi, Multimedia, etc.



Funcionamento da unidade curricular

- **Componente prática**
  - Assignments (tarefas de casa), para entregar ao final das aulas práticas ou numa data posterior
  - Valor 40% da nota final
  - Nota mínima: 7
- **Componente teórica**
  - Exame escrito, componente teórico-prático
  - Valor 60% da nota total.
  - Nota mínima: 7

Funcionamento da unidade curricular

- **Componente prática**
  - Labs with Wireshark, cerca de 4~6, para entregar ao final da Aula.
  - Ler um artigo e resolver perguntas
    - Artigos geralmente tratam de redes mas também vamos introduzir uma componente de segurança.

Corpo Docente e Aulas

- **Teóricas e Práticas**:
  - Docente: Néstor Cataño
  - Email: nestor.catano@gmail.com
  - Sala Aula Teórica: por definir
  - Salas de Aulas Práticas: por definir

Planeamento - aulas teóricas

Teóricas		
Semana 1		**9-13 Set**
T1	Presentation	
T2	Introduction to computer networks	
Semana 2		**16-20 Set**
T3	The link (ethernet) layer	
T4	The link (ethernet) layer (cont)	
Semana 3		**23-27 Set**
T5	The internetwork layer	
T6	The internetwork layer (cont)	
Semana 4		**9 - 13 Outubro**
T7	ARP and DHCP	
T8	ARP and DHCP (cont)	
Semana 5		**16 - 20 Outubro**
T9	UDP	
T10	UDP (cont)	
Semana 6		**23 - 27 Outubro**
T11	DNS	
T12	DNS (cont)	
Semana 7		**30 Out - 3 Nov**
T13	TCP	
T14	TCP (cont)	

Planeamento - aulas teóricas

Semana 8		**6 - 10 Novembro**
T15	Networking outlook	
T16	Networking outlook (cont)	
Semana 9		**13 - 17 Novembro**
T17	Wireless and mobile networks	
T18	Wireless and mobile networks (cont)	
Semana 10		**20 - 24 Novembro**
T19	Security	
T20	Security (cont)	
Semana 11		**27 Nov - 1 Dez**
T21	TLS	
T22	TLS (cont)	
Semana 12		**4 - 8 Dez**
T23	TLSTunnelling: VPN/SSH	
T24	TLSTunnelling: VPN/SSH (cont)	
Semana 13		**11 - 15 Dez**
T25	Network defense	
T26	Network defense (cont)	
Semana 14		**18 - 22 Dez**
T27	Revision	
T28	Type exam resolution	

Planeamento - aulas práticas

	Labs		Labs	Graded?
	L1	Independent in-class work	Wireshark - Introduction	FALSE
	L2	Short introduction to statistics	Wireshark - PCAP files and statistics	TRUE
	L3	Presentation on man-in-the-middle and NAT	Myths and truths about IPv6	TRUE
	L4	Presentation on man-in-the-middle and NAT	Wireshark - Packets capture	TRUE

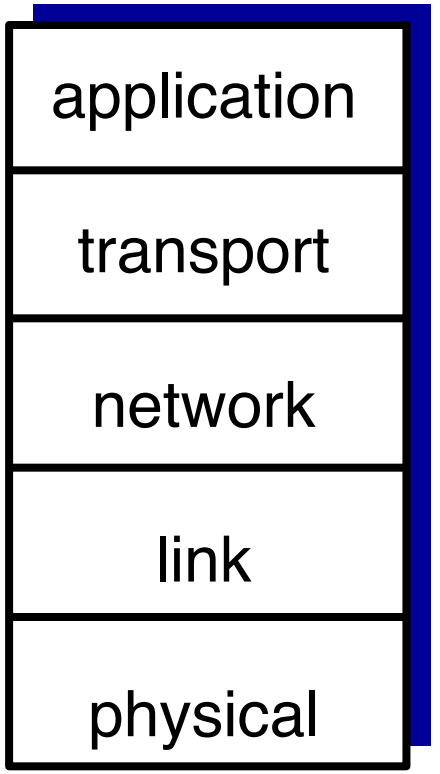
Modelo OSI a 4-camadas

application: supporting network applications
    FTP, SMTP, HTTP, DNS

transport: process-process data transfer
    TCP, UDP

network: routing of datagrams from source to destination
    IP, routing protocols

link: data transfer between neighbouring network elements
    Ethernet, 802.111 (WiFi), PPP



Computer networks

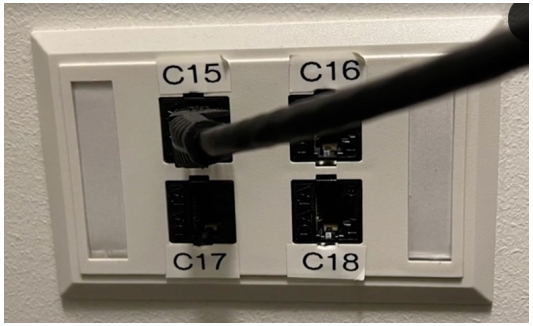
- the **role** of computer networks is to connect computers whether within an office or to the Internet
- **computer networks** allow us
  - to send email messages around the world
  - to stream video
  - to print a document
  - …

Computer networks

- **LAN** (local area network)
  - networks that we have at our home or offices
- **WAN** (Wide Area Network - rede de longa distância).
  - **LAN**s are connected to **WAN**s
  - **WAN**s allow us to be connected to the global Internet

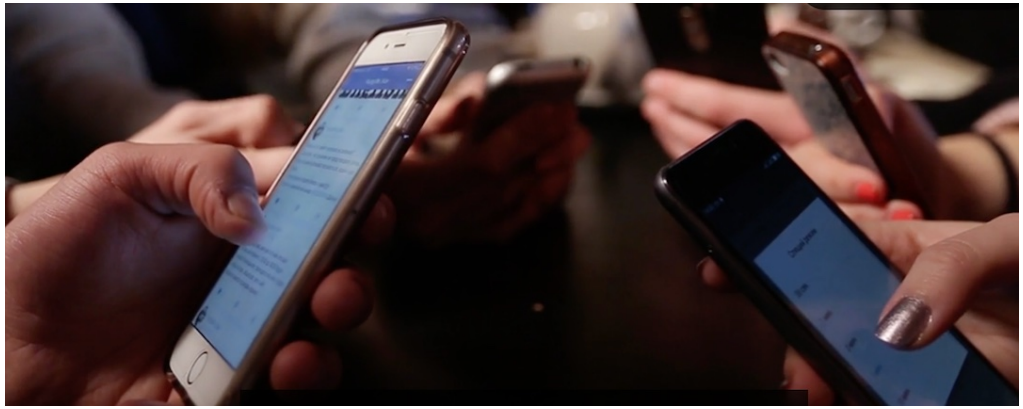
How do devices connect to a LAN?

- **Wired network connection**
  - Using an ethernet cable from the laptop a jack in the wall.
  - Major inconvenience: connection requires physical cables between the devices.



How do devices connect to a LAN?

- **Wi-Fi connection**
  - A wireless network creates a wireless **LAN**
- **Bluetooth connection**
  - It creates a personal area network (**PAN**)
  - It's meant to support 1 connection



Resumo

- Perguntas, dúvidas?
- **Aula prática**: Lab básico com **Wireshark**.
- Can you go to **mentimeter.com** and answer the following poll? Use your full name and the code **57711249**.