

Network Computing courses

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ENSIBS - UBS

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Figure: teaching.auzias.net

Course details

Objectives

- How do *computers* communicate?
- What are the mechanisms **under** an HTTP request or a telegram message?
- Networks are all around us, better study them!



Figure: netpremacy.com



more awesome pictures at THEMETAPICTURE.COM

Evaluation

- Short test at the beginning of every lesson (5 min) ?
- Project
- Final exam (1 hour)
- All same weighting

Material

- Slides available at teaching.auzias.net (github too)

Presentation Outline

- 1 Introduction
 - Definitions and presentation
 - HTTP request/response example
 - Network classification
 - Models overview (OSI and TCP/IP)
- 2 Lower layers
 - Physical
 - Data Link
 - Network
 - Transport
- 3 Upper layers
 - Session
 - Presentation
 - Application

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- **(world wide) Web: network** consisting of a collection of Internet websites using HTTP
- **HTTP:** Hypertext Transfer Protocol **Protocol**, application-level protocol for distributed, collaborative, hypermedia information systems [draft HTTP2 \(July 2014\)](#)

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- **Fat client: application** where most functions are processed by the client itself
- **Thin client: application** where most functions are carried out on a central server

Example

Enter getbootstrap.com in your browser

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Source	Destination	Protocol	Length	Info
192.168.0.48	208.67.222.222	DNS	76	Standard query 0x4797 A getbootstrap.com
208.67.222.222	192.168.0.48	DNS	108	Standard query response 0x4797 A 192.30.252.154 A 192.30.252.153

Figure: DNS request/response

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127.0.0.1	127.0.0.13	TCP	74	36159 > http [SYN] Seq=0 Win=43690 Len=0 MSS=65495 SACK_PERM=1 TSval=122257 TSecr=0 WS=128
127.0.0.13	127.0.0.1	TCP	74	http > 36159 [SYN, ACK] Seq=0 Ack=1 Win=43690 Len=0 MSS=65495 SACK_PERM=1 TSval=122257 TSecr=0
127.0.0.1	127.0.0.13	TCP	66	36159 > http [ACK] Seq=1 Ack=1 Win=43776 Len=0 TSval=122257 TSecr=122257
127.0.0.1	127.0.0.13	HTTP	356	GET /index.html HTTP/1.1
127.0.0.13	127.0.0.1	TCP	66	http > 36159 [ACK] Seq=1 Ack=291 Win=44800 Len=0 TSval=122259 TSecr=122259
127.0.0.13	127.0.0.1	HTTP	354	HTTP/1.1 200 OK (text/html)
127.0.0.1	127.0.0.13	TCP	66	36159 > http [ACK] Seq=291 Ack=289 Win=44800 Len=0 TSval=122259 TSecr=122259
127.0.0.1	127.0.0.13	HTTP	357	GET /favicon.ico HTTP/1.1
127.0.0.13	127.0.0.1	HTTP	565	HTTP/1.1 404 Not Found (text/html)
127.0.0.1	127.0.0.13	TCP	66	36159 > http [ACK] Seq=582 Ack=788 Win=45952 Len=0 TSval=122269 TSecr=122269

Figure: HTTP request/response

How does messages reach destination ?

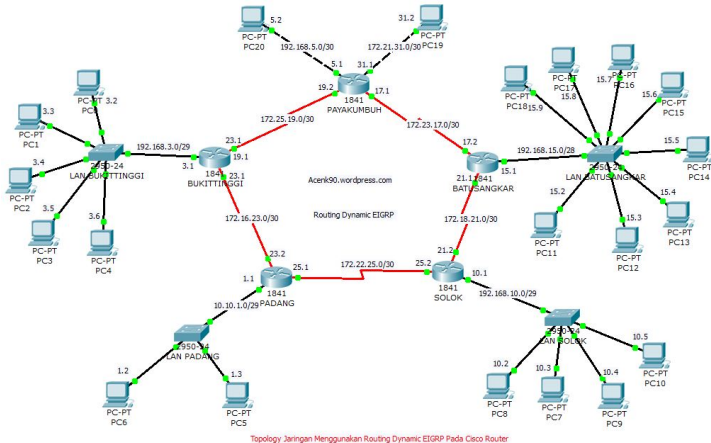


Figure: acenk90.files.wordpress.com

What kind of networks is it ?

- **PAN:** Personal Area Networks are used for communication among various devices, such as telephones, personal digital assistants, fax machines, and printers, that are located close to a single user.
- **(W)LAN:** (Wireless) Local Area Networks cover a small physical area, like a home, office, or a small group of buildings, such as a school or airport.
- **MAN:** Metropolitan Area Networks are very large networks that cover an entire city.
- **WAN:** Wide Area Networks cover a broad area, like communication links that cross metropolitan, regional, or national boundaries. The Internet is the best example of a WAN.

How does it work ?

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From analog/logical signals up to messages

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