

COMPUTER NETWORKS FOUNDATIONS

Computer Networks

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Outline

- 1 Classification
- 2 Communication
- 3 Standard Models
- 4 Security



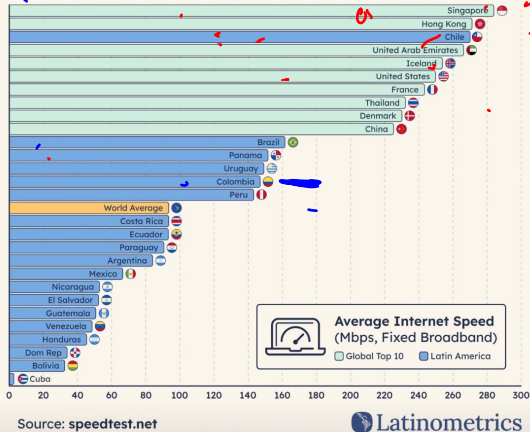
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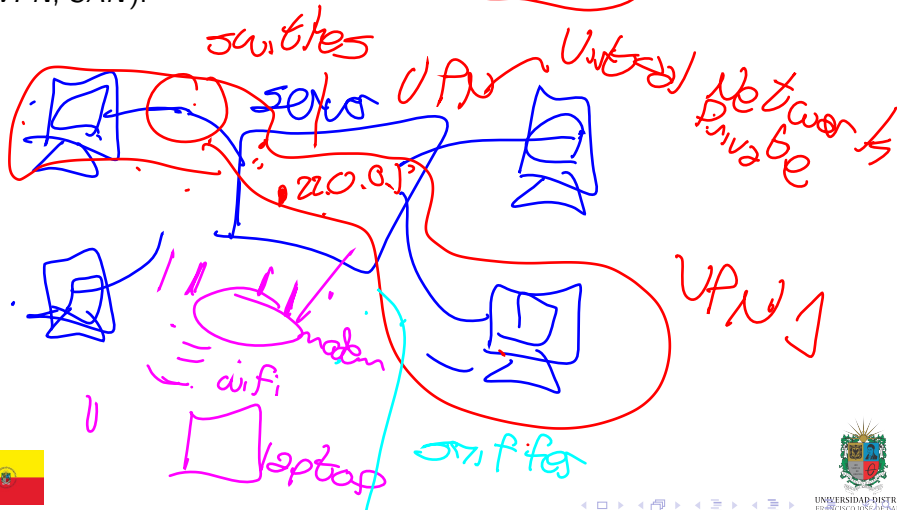
LATAM Internet Speed

Chile's internet speed is faster than yours



Basic Classification

Classification depends on geographical distribution or services shared (VPN, SAN).



Work Area Classification

Work area Classification depends on network size and geographical distribution. In this case, we have: PAN, LAN, MAN, and WAN.

PAN → Personal Area Networks
 LAN → Local Area Networks
 MAN → Medium Area Networks
 WAN → Wide area networks



Network Topologies

Network Topology Types

1 Point to point



2 Bus



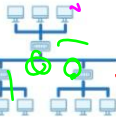
3 Ring



4 Star



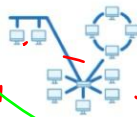
5 Tree



6 Mesh



7 Hybrid



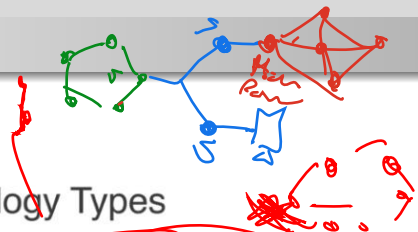
PLD



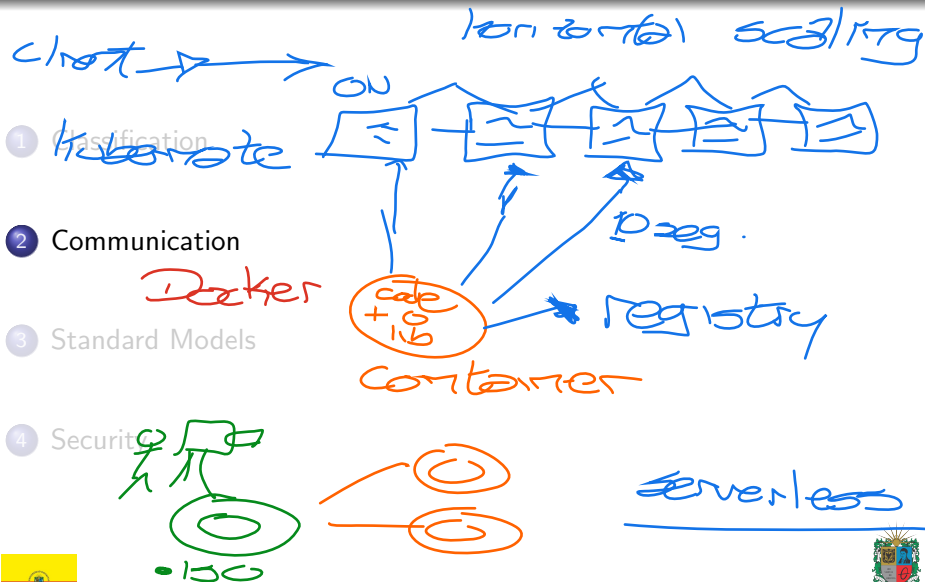
WLAN + LAN



zigbee



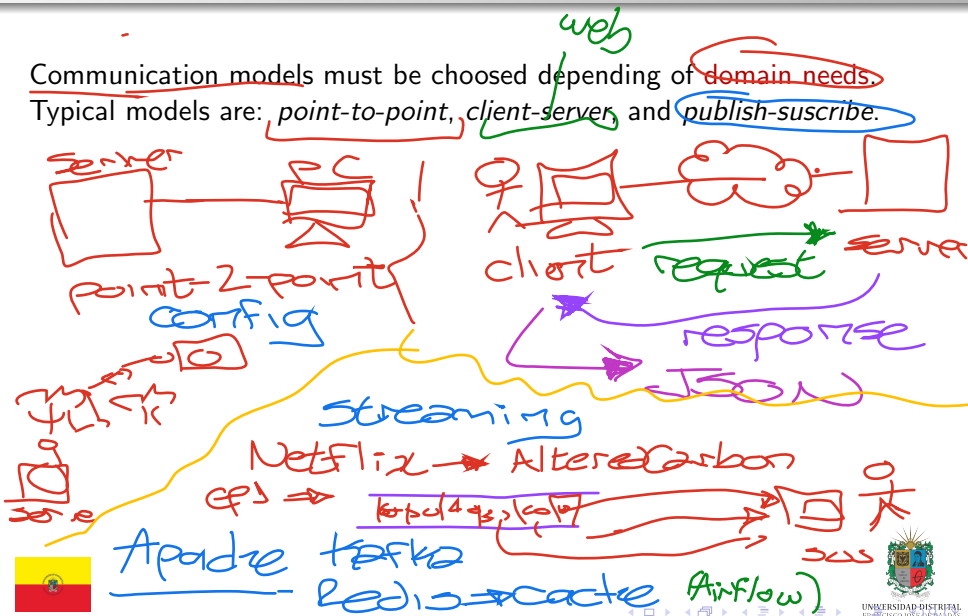
Outline



Communication Models

Communication models must be chosen depending of domain needs.

Typical models are: point-to-point, client-server, and publish-subscribe.



Communication Standards

First at all, protocols are defined as set of standardized rules. There are two types of protocols: de facto and de jure.

manufacturers

voice-2-voice

IPv6
(2007)

Organizations

IPv4

↳ ISO, IEEE

↳ Matter

250⁴



Outline

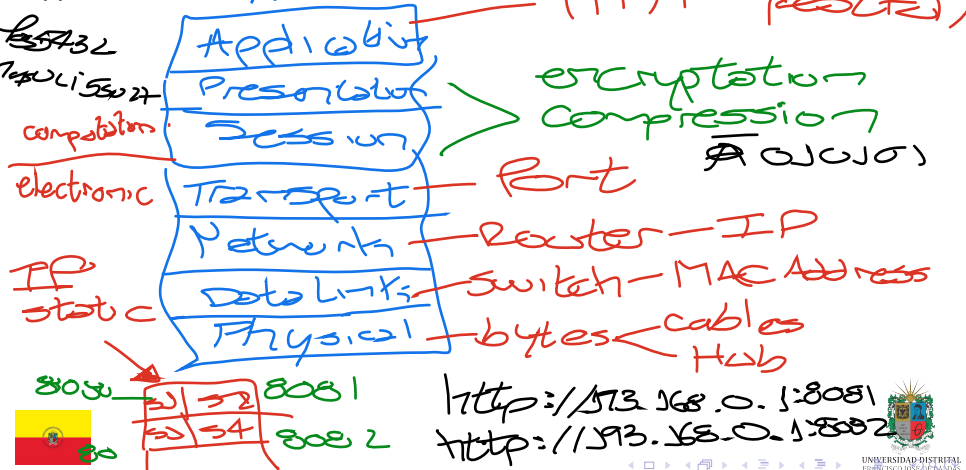
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OSI Model

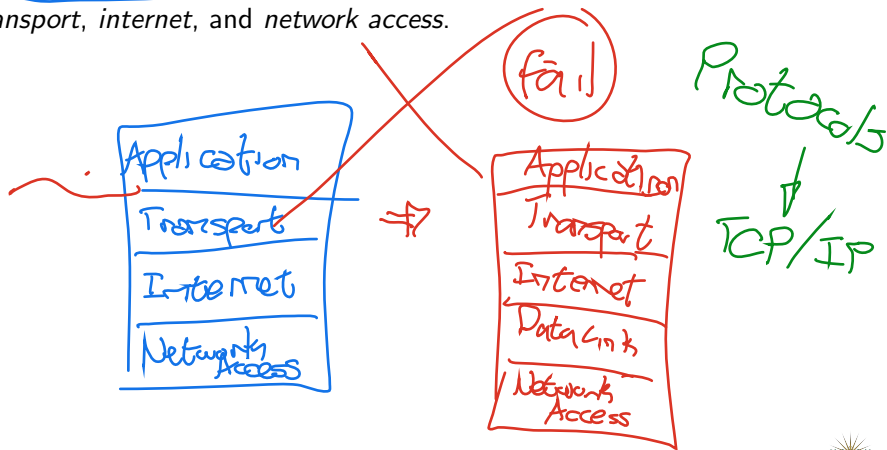
The Signal and the Noise

Open Systems Interconnection (OSI) model describes seven layers: physical, data link, network, transport, session, presentation, and application.



DoD Model

Department of Defense (DoD) model describes four layers: *application*, *transport*, *internet*, and *network access*.



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Networks Security

Protocol and standard **compliance** protects data, resources and networks.

Important aspects here are: interoperability, security baseline, and vulnerability management.

→ kali

→ JIRA } bitcoin missing

SSH → Secure Shell Protocol

commands bash

user password

cli

```
ssh
user:pass@
ip:port
```



PC

server
IP static

connect = "admin:123@ip"

• env

5 DS/mlops
2 DevOps
5 front
4 back

2 sec
2 sec

50
30 seller
50

Factoring

20 burgers

ML
Risk
unfair



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Thanks!

Questions?



Repo: <https://github.com/EngAndres/ud-public/tree/main/courses/computer-networking>

