

# COMPUTER NETWORKS FOUNDATIONS

## Computer Networks

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# Outline

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



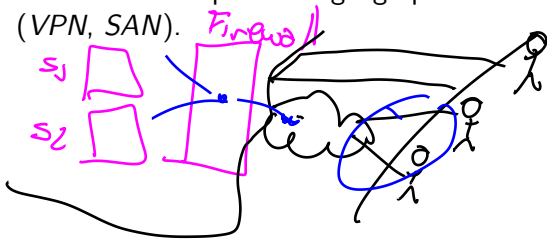
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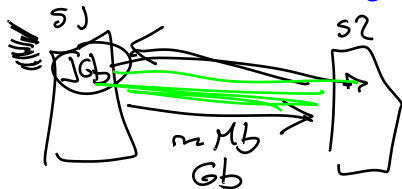
# Basic Classification

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



Authentication  
Virtual Private Network

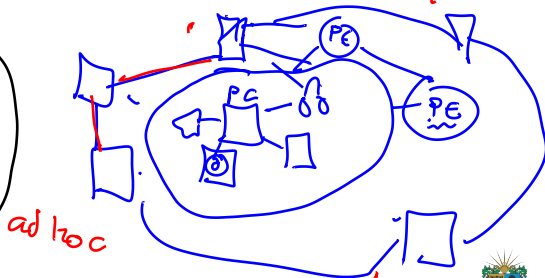
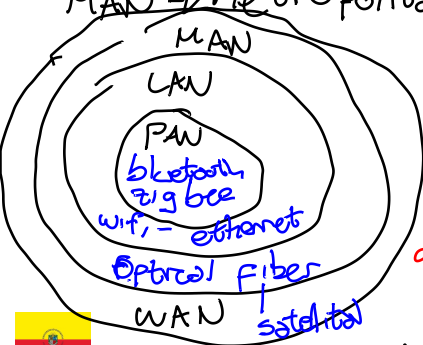
SAN → Storage Area Network



# Work Area Classification

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

PAN  $\Rightarrow$  Personal Area Network - house  
 LAN  $\Rightarrow$  Local Area Network - neighborhoods  
 MAN  $\Rightarrow$  Metropolitan Area Network city



WAN = Wide Area Network  $\leftarrow$  cities, countries



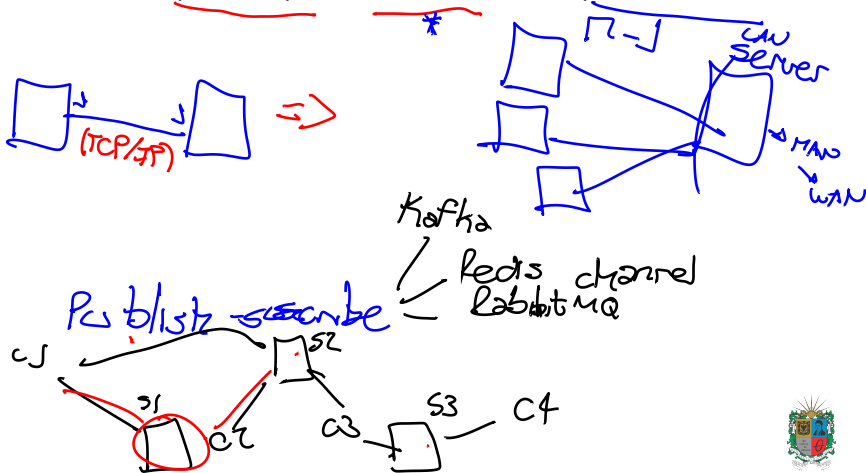
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- 2 **Communication**
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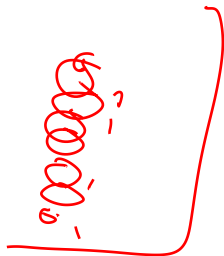
# Communication Models

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**.



De facto non-official  
standards.

De jure: standards provided by  
ISO/IEC







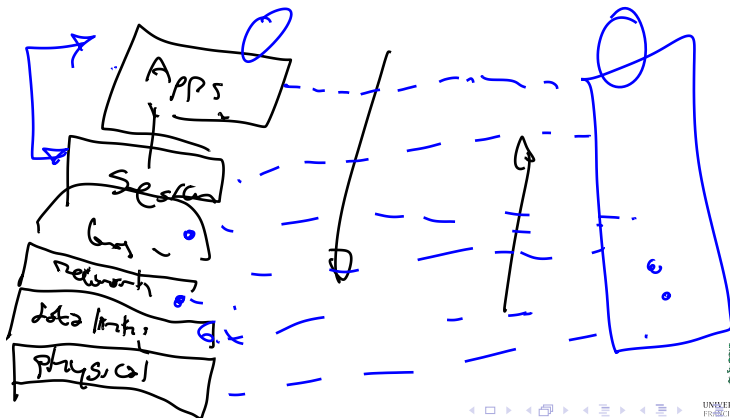
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# OSI Model

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

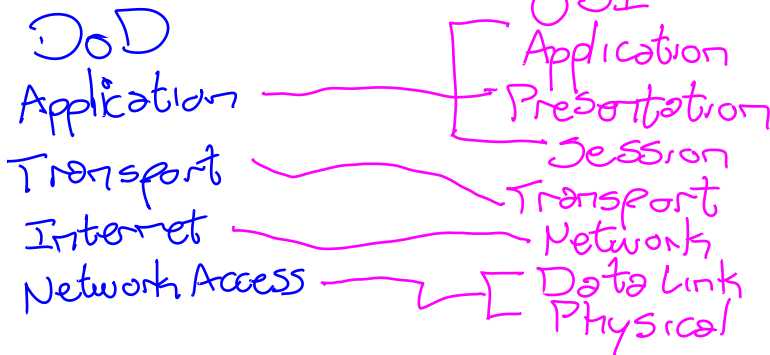


# DoD Model

→ DARPA ⇒ TCP/IP

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

TCP ⇒ Transmission Control Protocol  
IP ⇒ Internet Protocol




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# Networks Security

Protocol and standard **compliance** on-boarding protects data, resources and networks. Important aspects here are: *interoperability*, *security baseline*, and *vulnerability management*.

→ document + presentation + test  
 → Encrypt +  + VPN + credentials  
     universally unique identifier  
     two-factor Auth  
     keys  
     Auth2  
     Authentication



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# Thanks!

## Questions?



Repo: [github.com/engandres/ud-public/courses/computer-networks](https://github.com/engandres/ud-public/courses/computer-networks)

