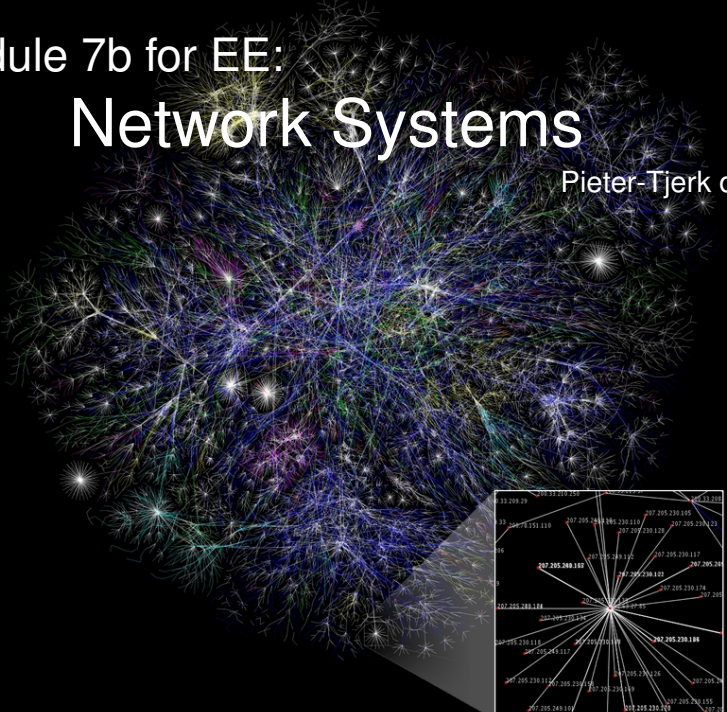


Module 7b for EE:

Network Systems

Pieter-Tjerk de Boer



What are network systems?

Network system = any system consisting of a large number of **communicating computers**.

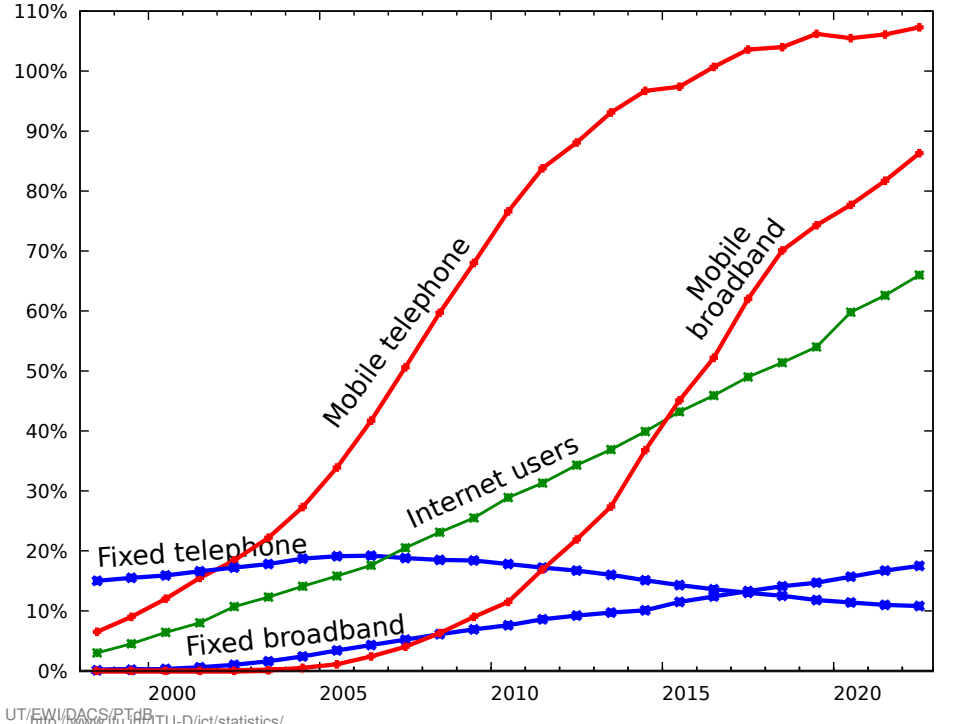
Examples:

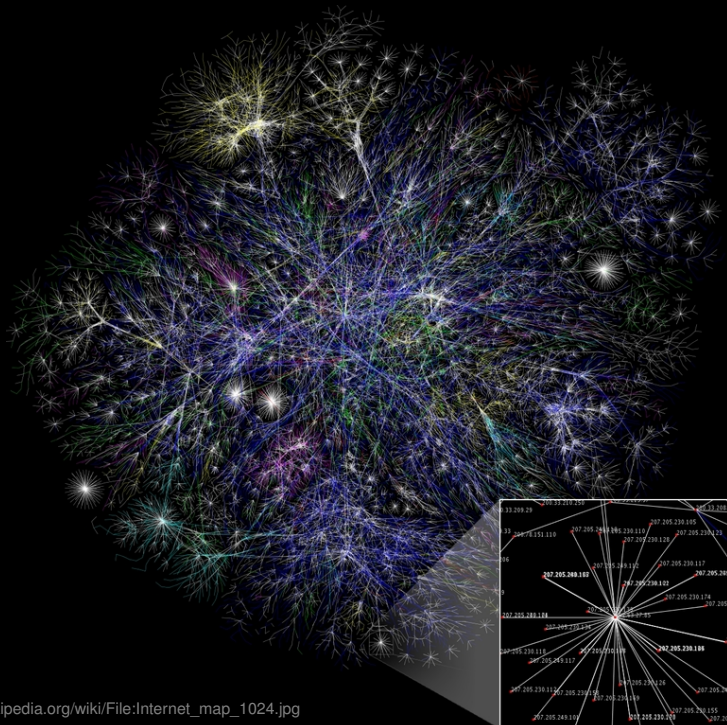
- ▶ The Internet
- ▶ Any of the Internet's sub-networks
- ▶ The mobile telephone network
- ▶ Sensor networks
- ▶ Networks connecting cars to improve traffic (near future)
- ▶ Internet-of-Things
- ▶ ...

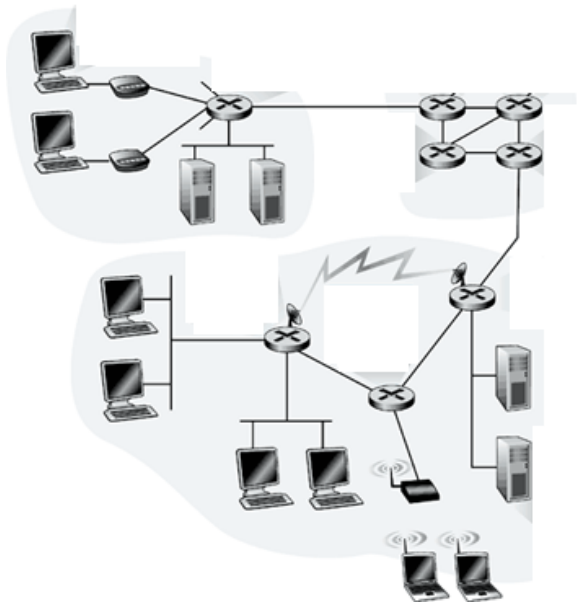
Shared module

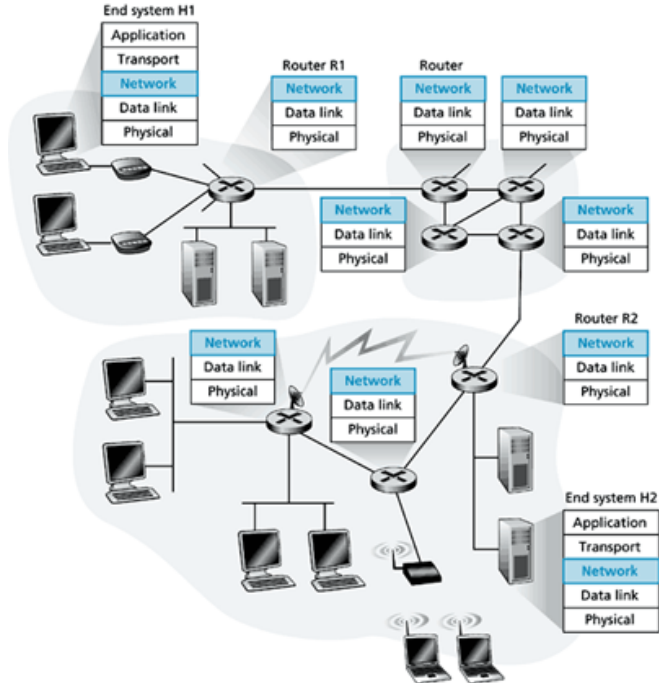
Network systems are at the boundary between EE and CS.

⇒ This module is shared with CS (1st year).



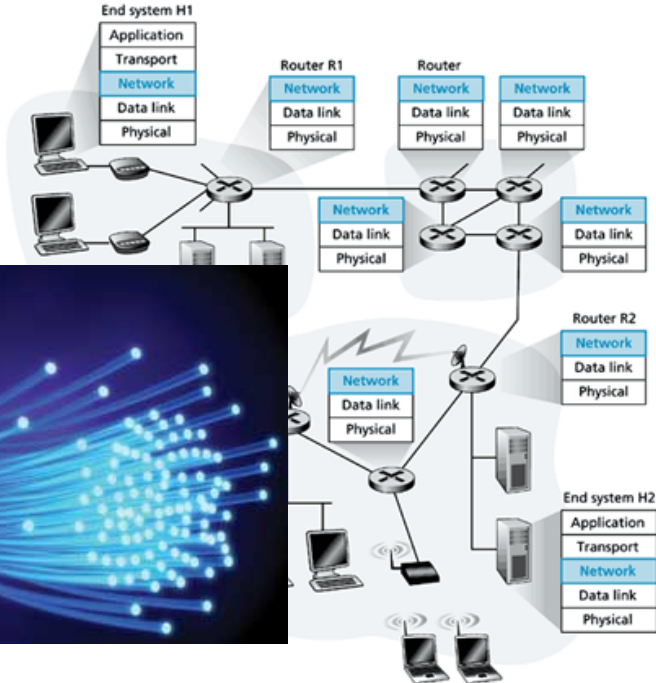
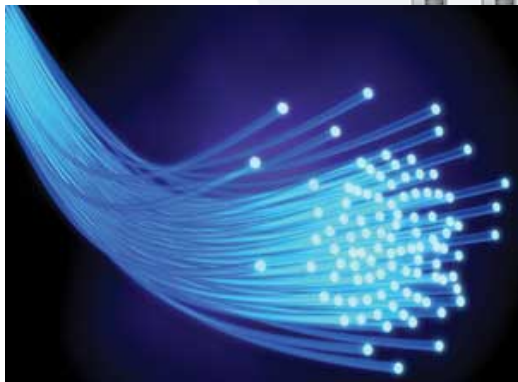






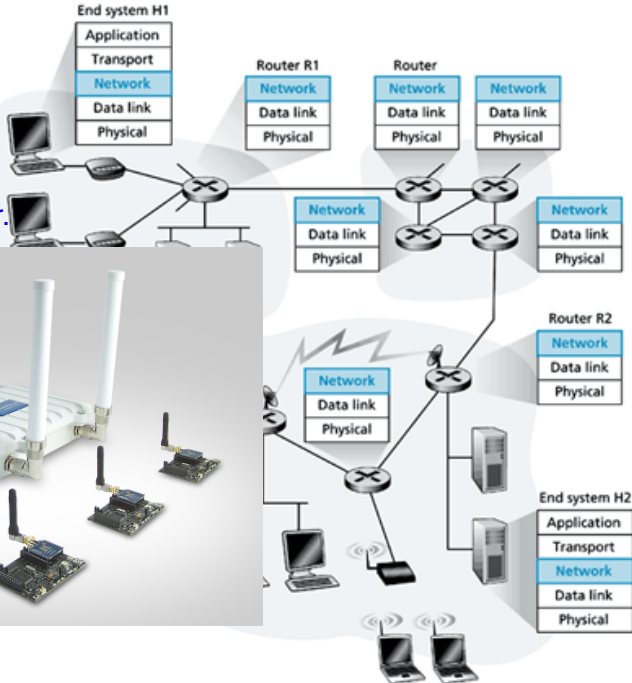
Physical layer:

signals
bit error correction
propagation



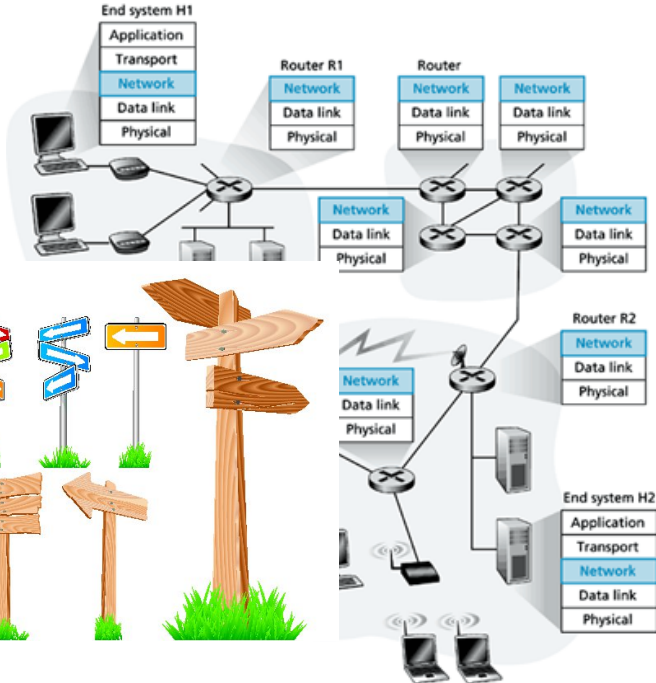
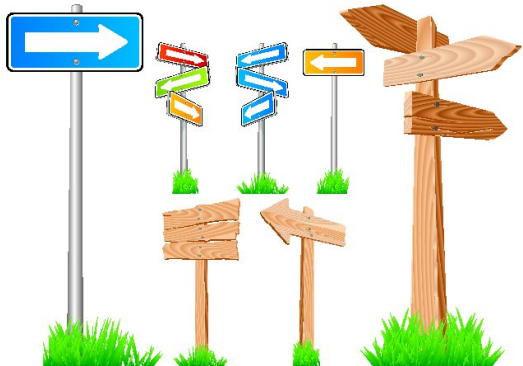
Link layer:

sharing a medium
retransmission algor.



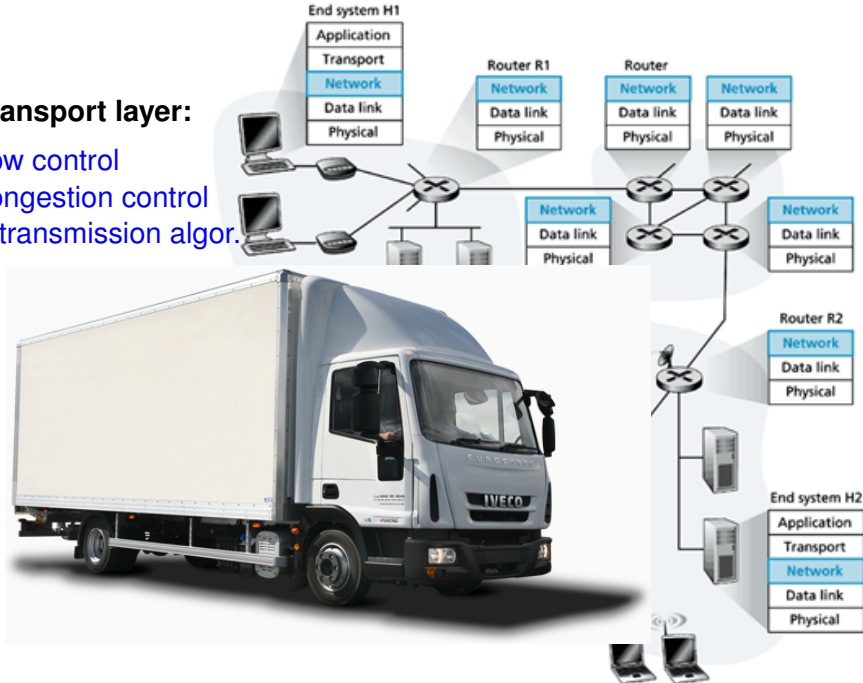
Network layer:

addressing
routing



Transport layer:

flow control
congestion control
retransmission algor.



Application layer:

email

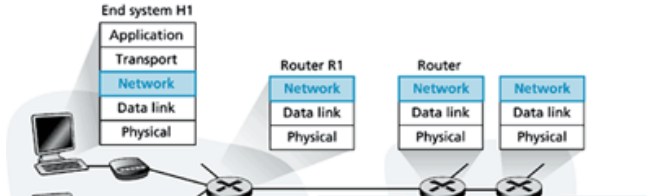
web

peer2peer

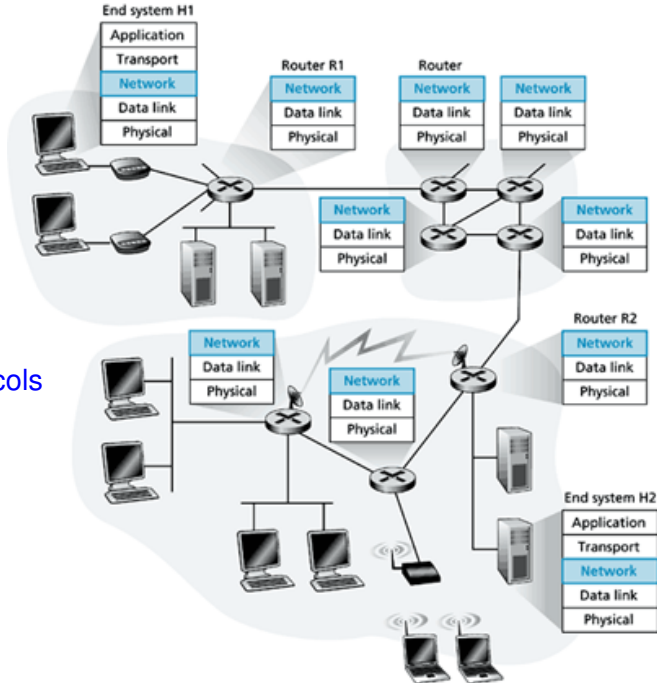
real-time audio/video



protocol design
monitoring
performance
security



basic principles
and
key internet protocols



Programming in C++

Only for EE students: (CS students do math)

- ▶ object-oriented programming
- ▶ algorithms
- ▶ datastructures

Module structure / activities

- ▶ 8 weeks, each typically consisting of:
 - ▶ 3 theory sessions (lecture/tutorial)
 - ▶ 1 observation session (Wireshark)
 - ▶ 1 “challenge”:
 - ▶ self-study
 - ▶ 375 millitests (i.e., 3 tests in the course of 8 weeks)
 - ▶ programming (some lectures + much practice)
- ▶ 2 weeks of integration project:
designing and implementing a communication system
- ▶ 1 week mostly for repairs

Module structure / activities

- ▶ 8 weeks, each typically consisting of:
 - ▶ 3 theory sessions (lecture/tutorial)
 - ▶ 1 observation session (Wireshark)
 - ▶ 1 “**challenge**”: find/create as good a solution as possible to some specific problem within 1 day
 - ▶ self-study
 - ▶ 375 millitests (i.e., 3 tests in the course of 8 weeks)
 - ▶ programming (some lectures + much practice)
- ▶ 2 weeks of integration project:
designing and implementing a communication system
- ▶ 1 week mostly for repairs

Network Systems

Questions? Ask now or mail me: p.t.deboer@utwente.nl

