CT3531 Nets & Comms 2

Introduction and Review

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Course Contents

- Virtual LANs
- Router Platform (Mikrotik RouterOS)
- Network Simulation (Lab Work)
- Dynamic Routing (OSPF and BGP)
- BGP and Internet Exchanges
- Network Security
- Network Programming
- More on IPv6

Intro Lecture

- Introduction to Computer Networks
- OSI Reference Model
- Development of the Internet
- Internet Applications
- Internet and Society
- Conclusions

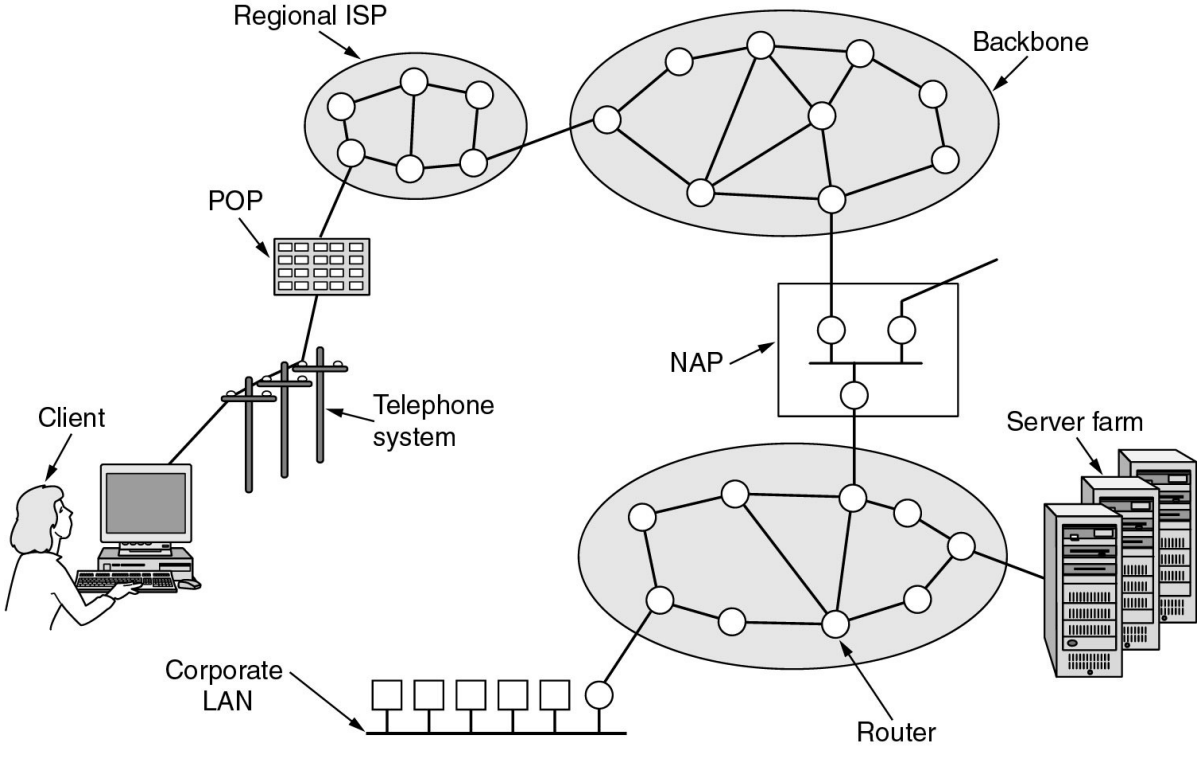
Network Classification

- Classification of interconnected processors by scale.

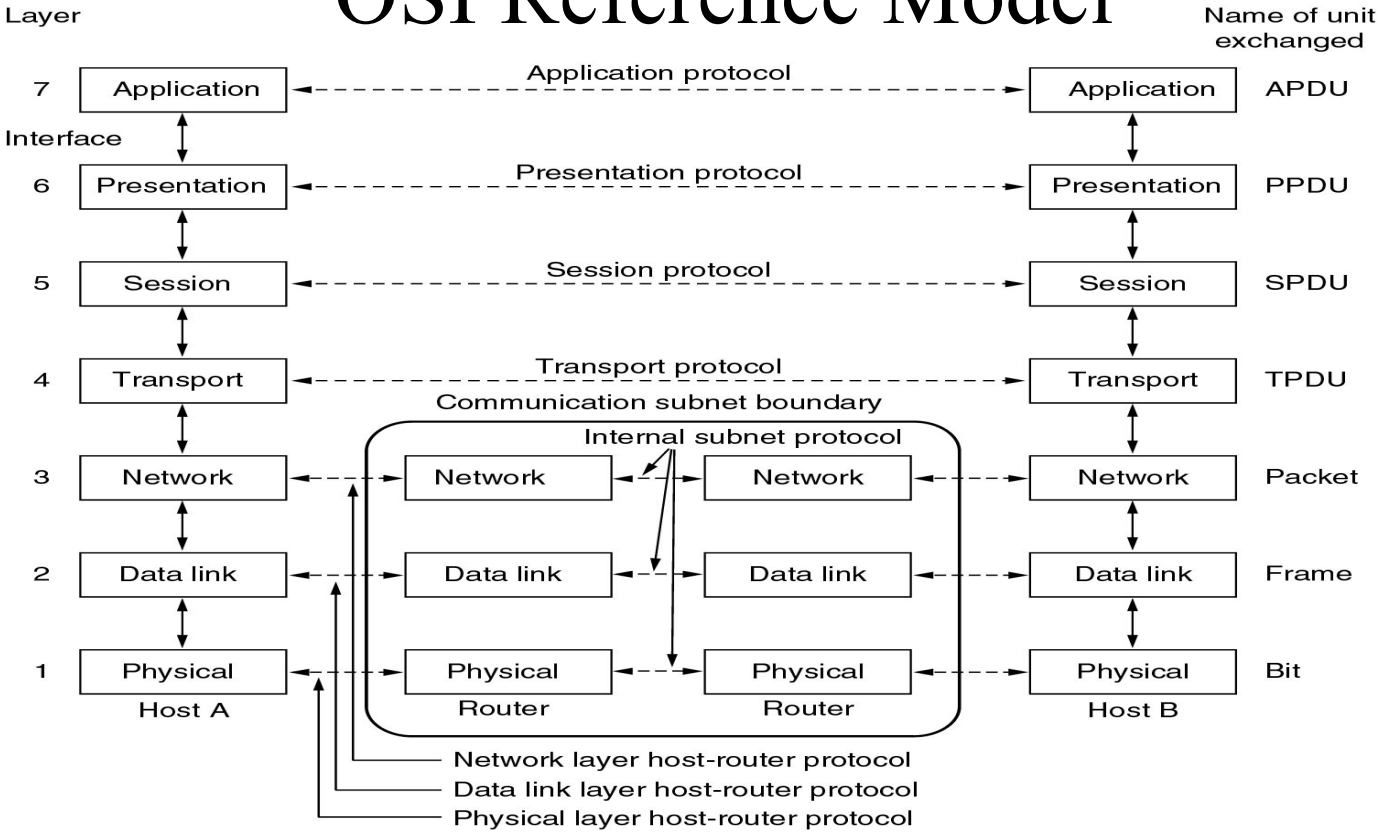
Interprocessor distance	Processors located in same	Example
1 m	Square meter	Personal area network
10 m	Room	Local area network
100 m	Building	
1 km	Campus	
10 km	City	Metropolitan area network
100 km	Country	Wide area network
1000 km	Continent	
10,000 km	Planet	The Internet

Architecture of the Internet

- Overview of the Internet

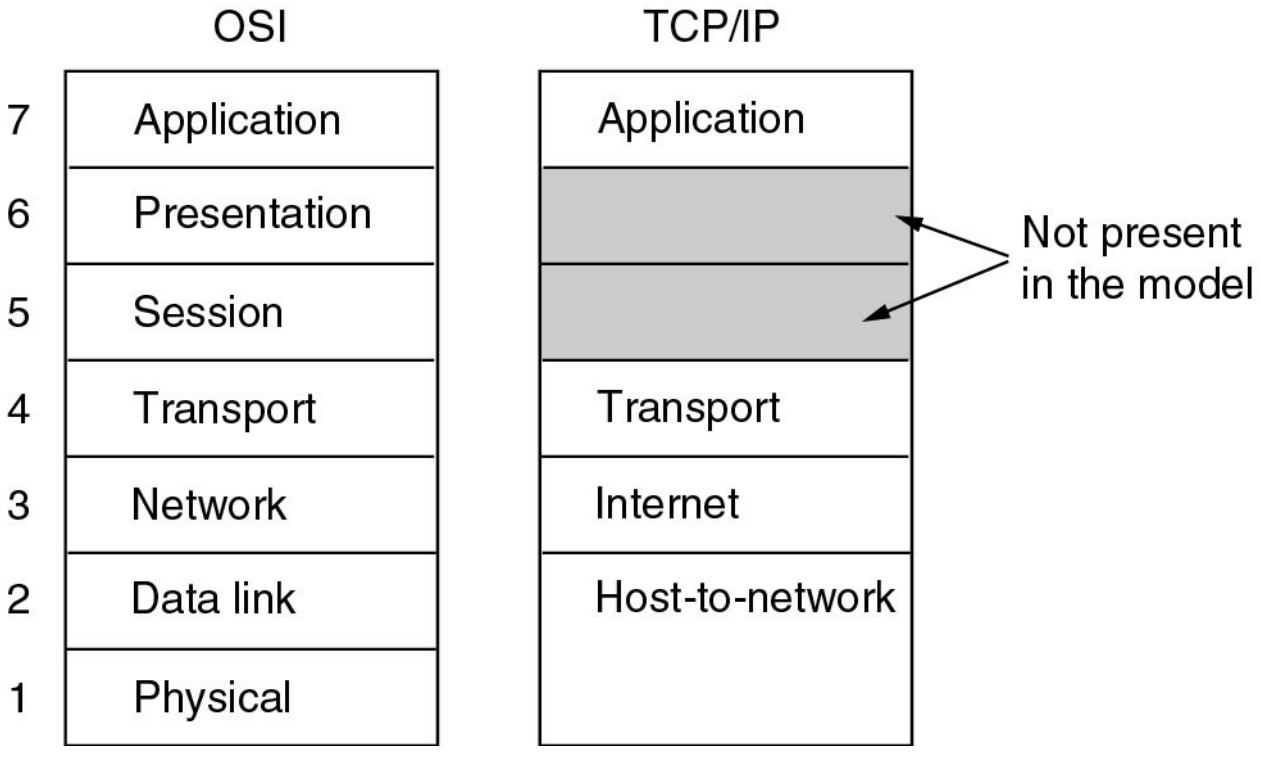


OSI Reference Model



OSI (Open Systems Interconnect) – Network architecture based on a proposal developed by ISO (International Standards Organization) to standardize the protocols used in various layers

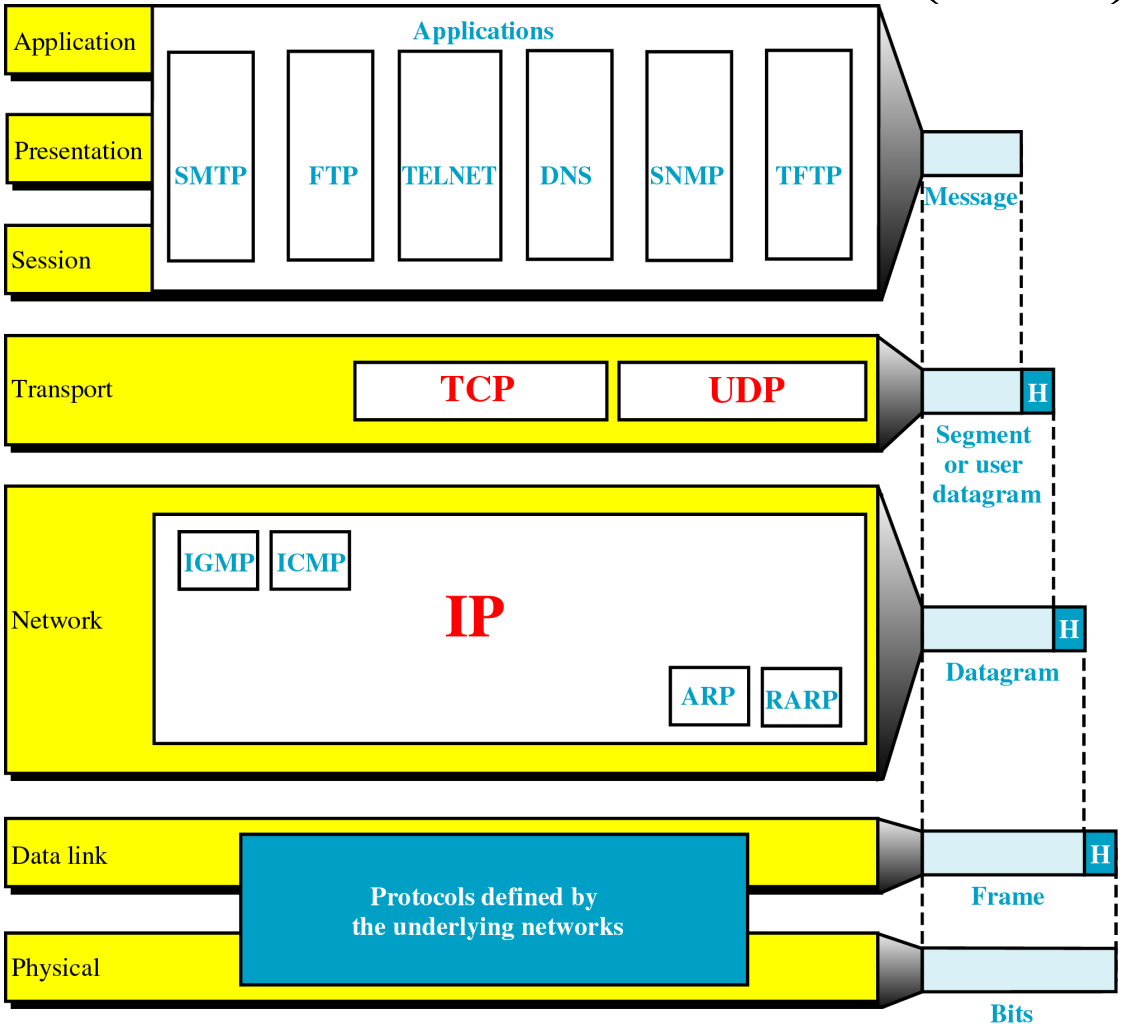
TCP/IP Reference Model



- Used by Internet, packet switching network (of networks) based on a connectionless internetwork layer

Protocols used on the Internet (IPv4)

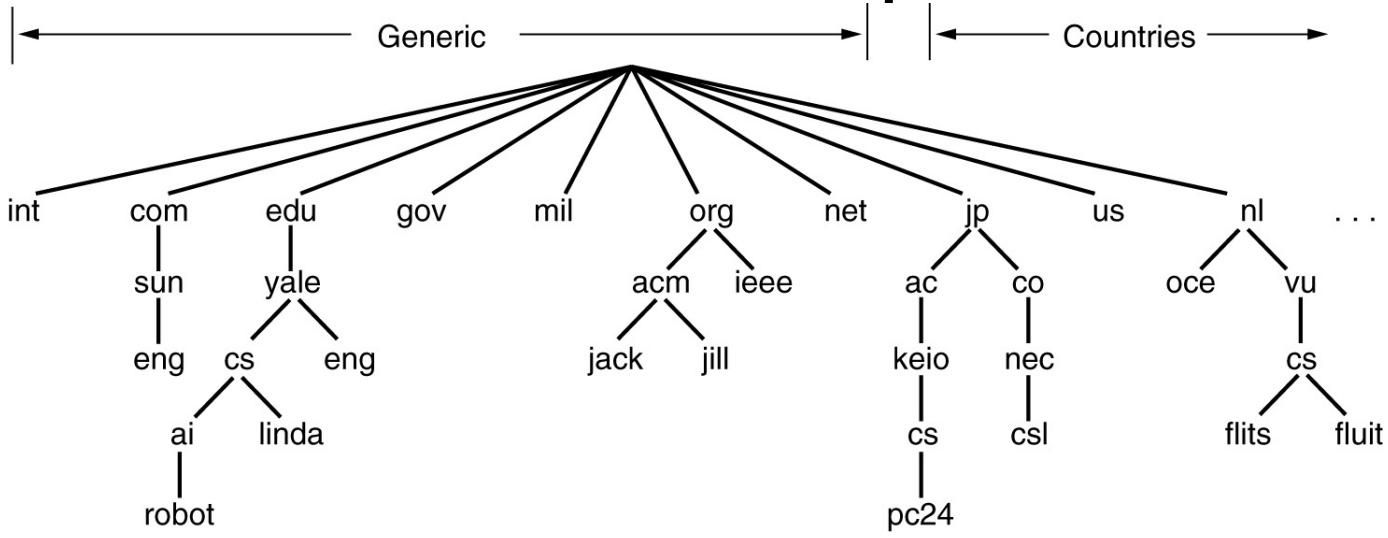
http / https



Future Internet Protocol IPv6

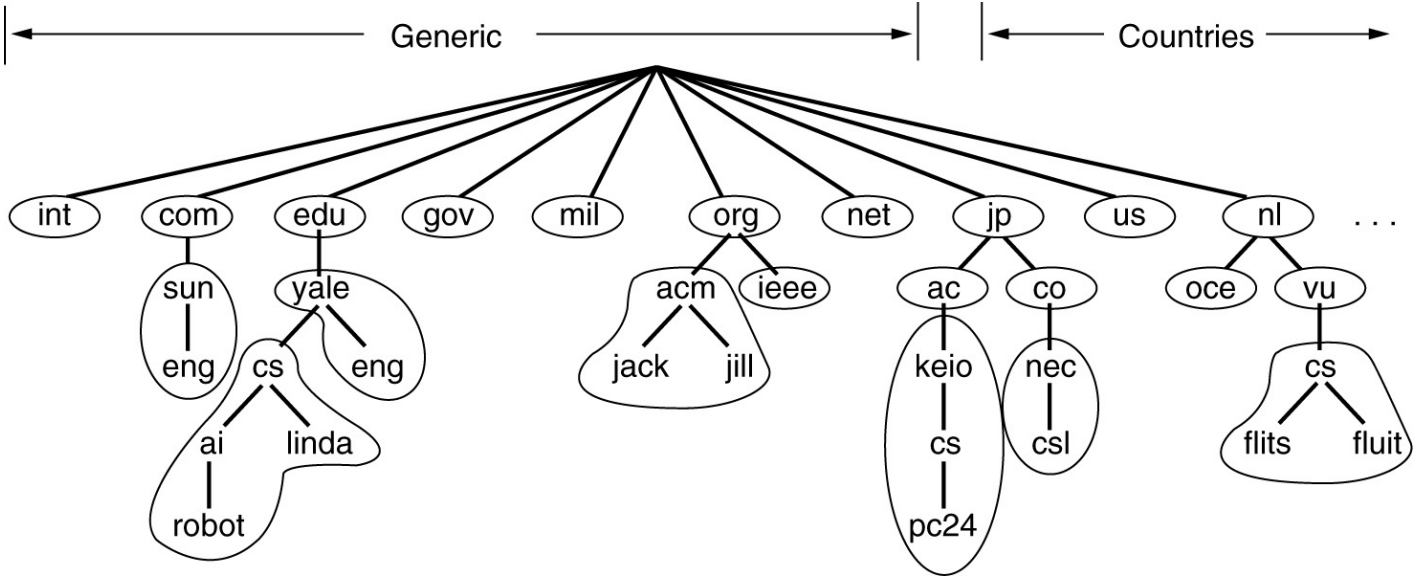
- CIDR and NAT may “buy” a few more years, but the days of IPv4 are numbered (shortage problem)
- 1990, IETF started to work on IPv6, with the following goals:
  - Support billion of hosts
  - Reduce the size of the routing tables
  - Simplify the protocol, to allow routers to process faster
  - Provide better security (auth and privacy) than IPv4
  - Pay more attention to type of service (for real time data)
  - Aid multicasting (by allowing scopes to be specified)
  - Make roaming possible without change of address

DNS Name Space



- Internet is divided into over 200 top level domains
  - Each domain is divided into sub-domains, which are further partitioned, etc..
  - All domains can be represented by a tree
    - The leaves of the tree represent domains that have no sub-domains (but contain machines)
    - A leaf domain may contain a single host or represent a company and contain thousands of hosts
- Top level domains could be generic and country domains

Name servers

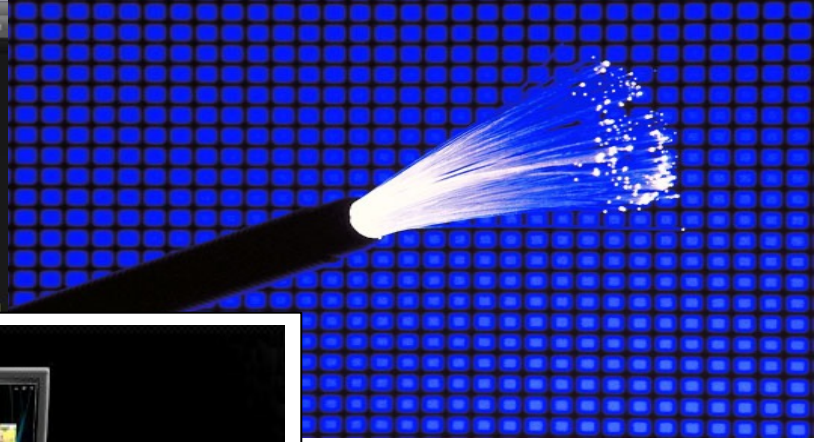


- One DNS server could service all requests
  - In practice it will be overloaded
- To solve this, DNS name space is divided in non overlapping zones
  - Each zone contains some part of the tree and name servers holding zone info
    - A zone would have a primary DNS (gets info from disk)
    - One or more secondary DNS (get info from the primary DNS)

Current Internet Trends

- Phenomenal changes in past 10 years
- VOIP and Video on Demand
- Social Networks
- Mobility


RTÉ player beta
Home
Latest
Last Chance
Categories
A to Z
My Videos
Live News
Help
RTÉ.ie
Programmes from 23 April 2009
Search
Calendar
03 Apr - 24 Apr




PowerCinema


ASUS

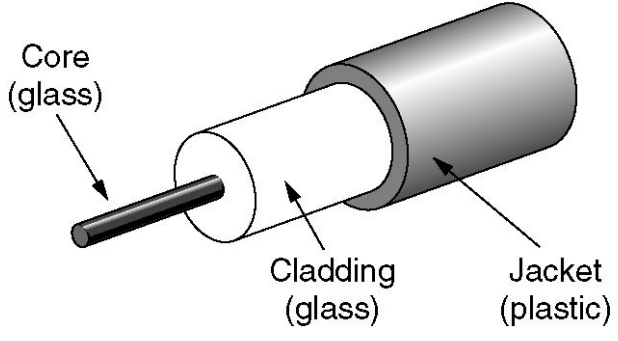

SKY SPORTS


SKY
SKY SLB200
THOMSON 5516

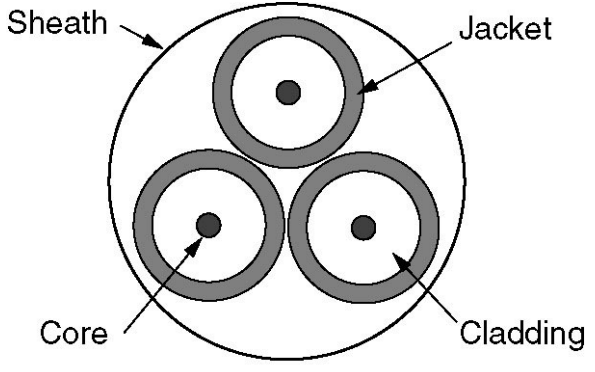
Fiber Cables

(a) Side view of a single fiber.

(b) End view of a sheath with three fibers.



(a)



(b)

Conclusions

- Optical networking and dense wavelength-division multiplexing (DWDM) is rapidly bringing down the cost of networking, and further progress seems assured
  - Butter's law says that the amount of data coming out of an optical fiber is doubling every nine months. Thus, the cost of transmitting a bit over an optical network decreases by half every nine months.

Conclusions

- Every industry will be affected by increasing and faster network coverage
- Transmission networks and media organisations at most immediate risk to changes
- Society itself is being changed by technological advances and better network connectivity