



La Sapienza

Università degli Studi di Roma

Dipartimento di Informatica e Sistemistica

Computer Networks II

Course overview

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 - By appointment
 - Contact teacher by email



□ Material

- Slides [Part of course material]
- Reference texts [None adopted]:
 - L. Peterson and B. Davie. Computer Networks: a system approach, third edition. Morgan Kaufmann
 - D. Comer. Internetworking with TCP/IP. Addison - Wesley
 - <http://www.netbook.cs.purdue.edu/index.htm>
- Research/specialistic references
- On-line documentation
- Prerequisites
 - J. F. Kurose e K. W. Ross "Computer Networks" Addison-Wesley

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▫ **Organization**

- Main topics covered by teacher during lessons
- Further readings on material/references suggested by teacher
 - Exercises
 - Reference cases

Exam

- For organization, see (for the moment):

www.dis.uniroma1.it/~becchett



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□ Prerequisites

- Ethernet and level1/2 devices (hub, switch...)
- Error detection/recovery
- Network/transport layers
- IP networking overview
- Overview of UDP/TCP and IP protocols
- Reliable transfer, basic mechanisms (sliding window protocols)
- Congestion control
- Application layers
- Main application protocols



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□ Overview of course topics

- TCP/IP review
- Main aspects of advanced IP routing (OSPF, RIP)
- Advanced aspects of IP addressing
- Private addressing, NAT, virtual private networks, tunnelling
- Firewall
- Autonomous systems and autonomous systems routing [BGP]
- Mobile IP overview
- End-to-end and router congestion control
- QoS aspects in NGN [Next Generation Networking]

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- Starting point... 1/3

OSI Model			
	Data unit	Layer	Function
Host layers	Data	7. Application	Network process to application
		6. Presentation	Data representation and encryption
		5. Session	Interhost communication
	Segment/Datagram	4. Transport	End-to-end connections and reliability
Media layers	Packet	3. Network	Path determination and logical addressing
	Frame	2. Data Link	Physical addressing (MAC & LLC)
	Bit	1. Physical	Media, signal and binary transmission

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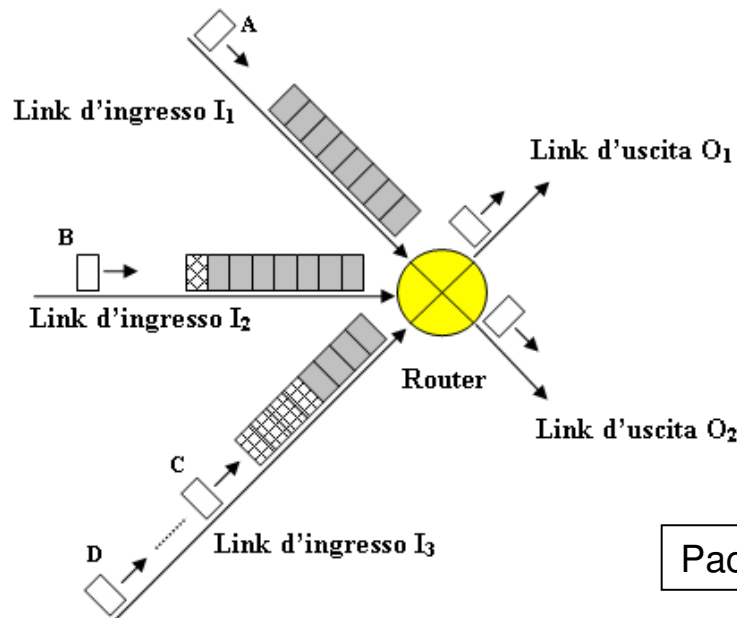
□ Starting point... 2/3

IP-based, unreliable service offered by Internet's network layer

Pacchetti IP affidati alla rete dall'host sorgente



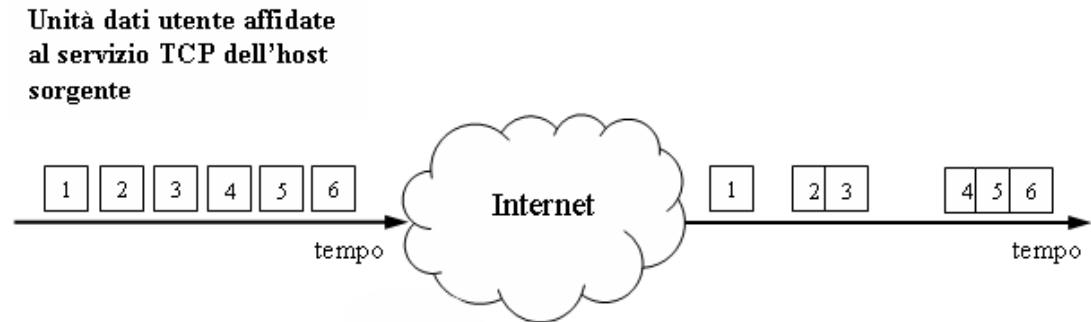
Pacchetti IP consegnati dalla rete all'host destinazione



Packet processing time at router is variable

□ Starting point... 3/3

Reliable service offered by TCP transport protocol



Unreliable service offered by UDP transport protocol

Unità dati utente affidate al servizio UDP dell'host sorgente



Unità dati utente consegnate dal servizio TCP allo strato applicativo nell'host destinazione

Unità dati utente consegnate dal servizio UDP allo strato applicativo nell'host destinazione



□ **Towards NGNs**

- NGNs: ITU-T's definition:
 - «A Next Generation Networks (NGN) is a packet-based network able to provide Telecommunication Services to users and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent of the underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and services of their choice. It supports generalised mobility which will allow consistent and ubiquitous provision of services to users.»
 - <http://www.itu.int/ITU-T/ngn/definition.html>
- Should allow packet transport of all information and services (voice, data, multimedia communications)