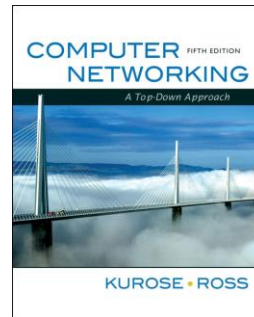


# RSC

## Part II: Network Layer

### 5. IPv6



#### Redes y Servicios de Comunicaciones Universidad Carlos III de Madrid

These slides are, mainly, part of the companion slides to the book "Computer Networking: A Top Down Approach" generously made available by their authors (see copyright below). The slides have been adapted, where required, to the teaching needs of the subject above.

All material copyright 1996-2009  
J.F Kurose and K.W. Ross, All Rights Reserved

Computer Networking:  
A Top Down Approach  
5<sup>th</sup> edition.  
Jim Kurose, Keith Ross  
Addison-Wesley, April  
2009.

Network Layer II-1

## RSC Part II: Network Layer

- ❖ II. 1 Basic Network layer concepts
- ❖ II.2 Introduction to IPv4
- ❖ II.3 IPv4 addressing
- ❖ II.4 IPv4 in operation
  - ARP
- ❖ II.5 IPv6
- ❖ II.6 Network routing
  - Link state
  - Distance Vector
- ❖ II.7 Routing in the Internet
  - Hierarchical routing
  - RIP

Cartagena99

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
LLAMA O ENVÍA WHATSAPP: 689 45 44 70

---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
CALL OR WHATSAPP:689 45 44 70

## IPv6: motivation

- ❖ *initial motivation*: 32-bit address space soon to be completely allocated.
- ❖ additional motivation:
  - header format helps speed processing/forwarding
  - header changes to facilitate QoS

### *IPv6 datagram format:*

- fixed-length 40 byte header
- no fragmentation allowed

Network Layer 4-3

## IPv6 datagram format

*priority*: identify priority among datagrams in flow

*flow Label*: identify datagrams in same “flow.”  
(concept of “flow” not well defined).

*next header*: identify upper layer protocol for data

ver	pri	flow label	
payload len		next hdr	hop limit
source address (128 bits)			

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
LLAMA O ENVÍA WHATSAPP: 689 45 44 70

---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
CALL OR WHATSAPP:689 45 44 70

Cartagena99

## Other changes from IPv4

- ❖ **checksum**: removed entirely to reduce processing time at each hop
- ❖ **options**: allowed, but outside of header, indicated by “Next Header” field
- ❖ **ICMPv6**: new version of ICMP
  - additional message types, e.g. “Packet Too Big”
  - multicast group management functions

Network Layer 4-5

The logo for Cartagena99 features the text 'Cartagena99' in a stylized, teal-colored font. The '99' is significantly larger and more prominent than the rest of the text. The logo is set against a light blue background with a white arrow pointing to the right, and a yellow shadow effect is visible beneath the text.

CLASES PARTICULARES, TUTORÍAS TÉCNICAS ONLINE  
LLAMA O ENVÍA WHATSAPP: 689 45 44 70

---

ONLINE PRIVATE LESSONS FOR SCIENCE STUDENTS  
CALL OR WHATSAPP:689 45 44 70