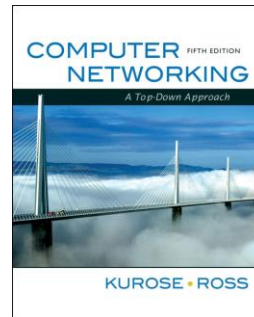# RSC
Part II: Network Layer
5. IPv6

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.

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

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

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

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)			

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