PSIT
Kanpur

COMPUTER NETWORKS RCS – 601

IP PROTOCOL- IPv6

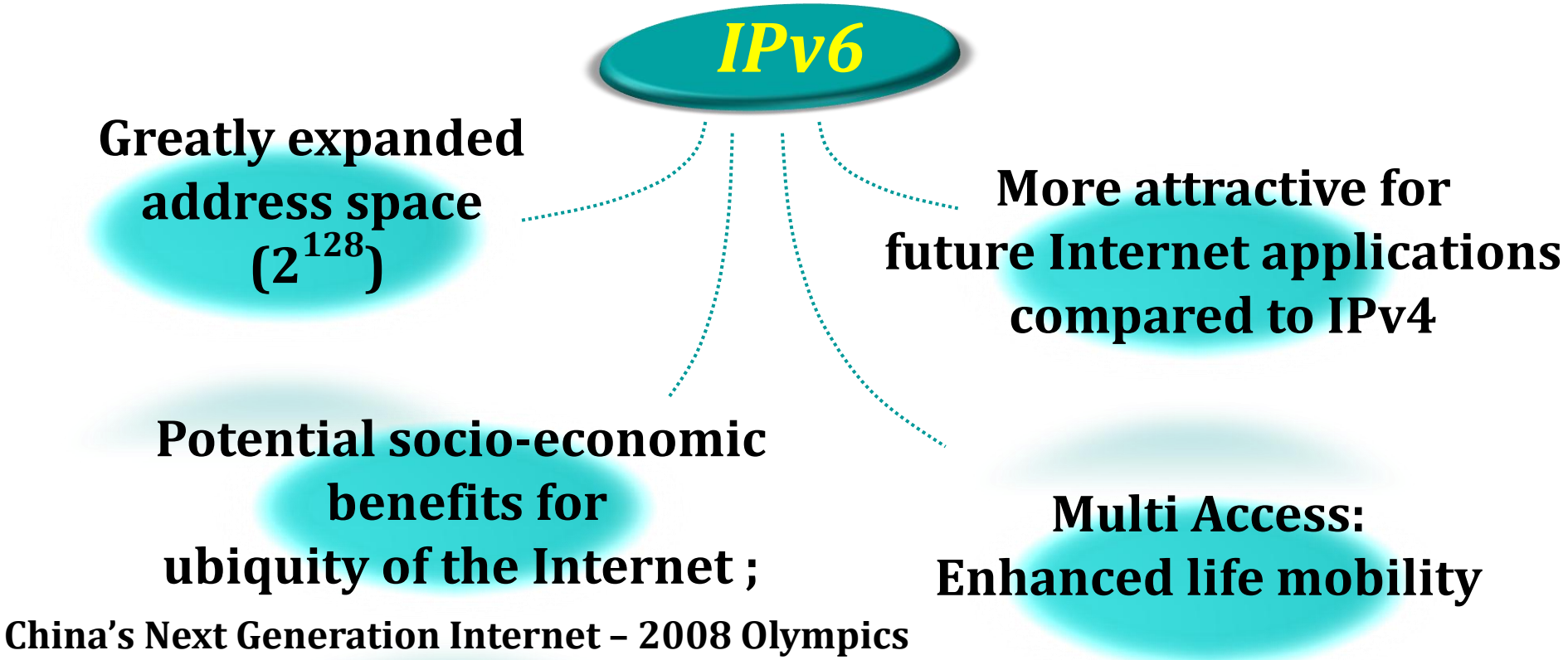
PSIT
Kanpur

IP Next Generation Protocol -*IPv6*

The network layer protocol in the TCP/IP protocol suite is currently IPv4. Although IPv4 is well designed, data communication has evolved since the inception of IPv4 in the 1970s. IPv4 has some deficiencies that make it unsuitable for the fast-growing Internet.

PSIT
Kanpur

IP Next Generation Protocol



PSIT
Kanpur

IPv6 Deployment: Vital to Bridging the Digital Divide

Internet is now a critical global infrastructure for socio-economic development and growing faster in developing countries :
It is necessary to take account of the needs of developing countries

Developing Countries have shown significant improvement in ICT but still lag behind in Internet access

Mobile/Wireless growing at a much faster rate than fixed networks

Relatively greater availability of mobile/wireless networks in many developing and emerging economies

Internet access using mobile networks: Lower Cost, Higher speed of deployment than fixed networks

Digital Divide may be reduced by extending mobile networks

PSIT
Kanpur

IPv6 Deployment: Essential for wireless Internet

Emergence of mobiles as platform for wireless Internet access especially in developing countries will put more pressure on the IP address space

Require a larger IP address space to enable wireless networking & mobility

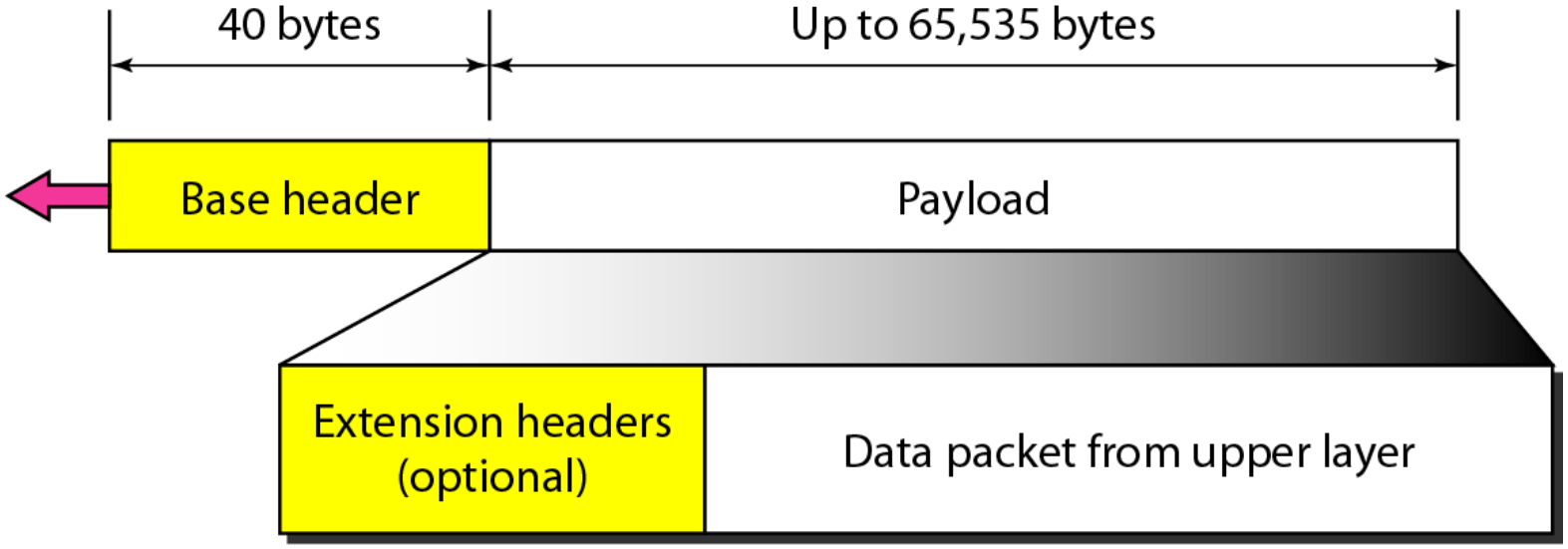
IPv6 protocol provides the availability & extensibility of IP addresses :
Large-scale sensor networks, IP Security, Mobile IPv6, IP-based Multimedia

IPv6 is emerging as the preferred platform and is a core component of the wireless Internet architecture (3G & Beyond 3G)

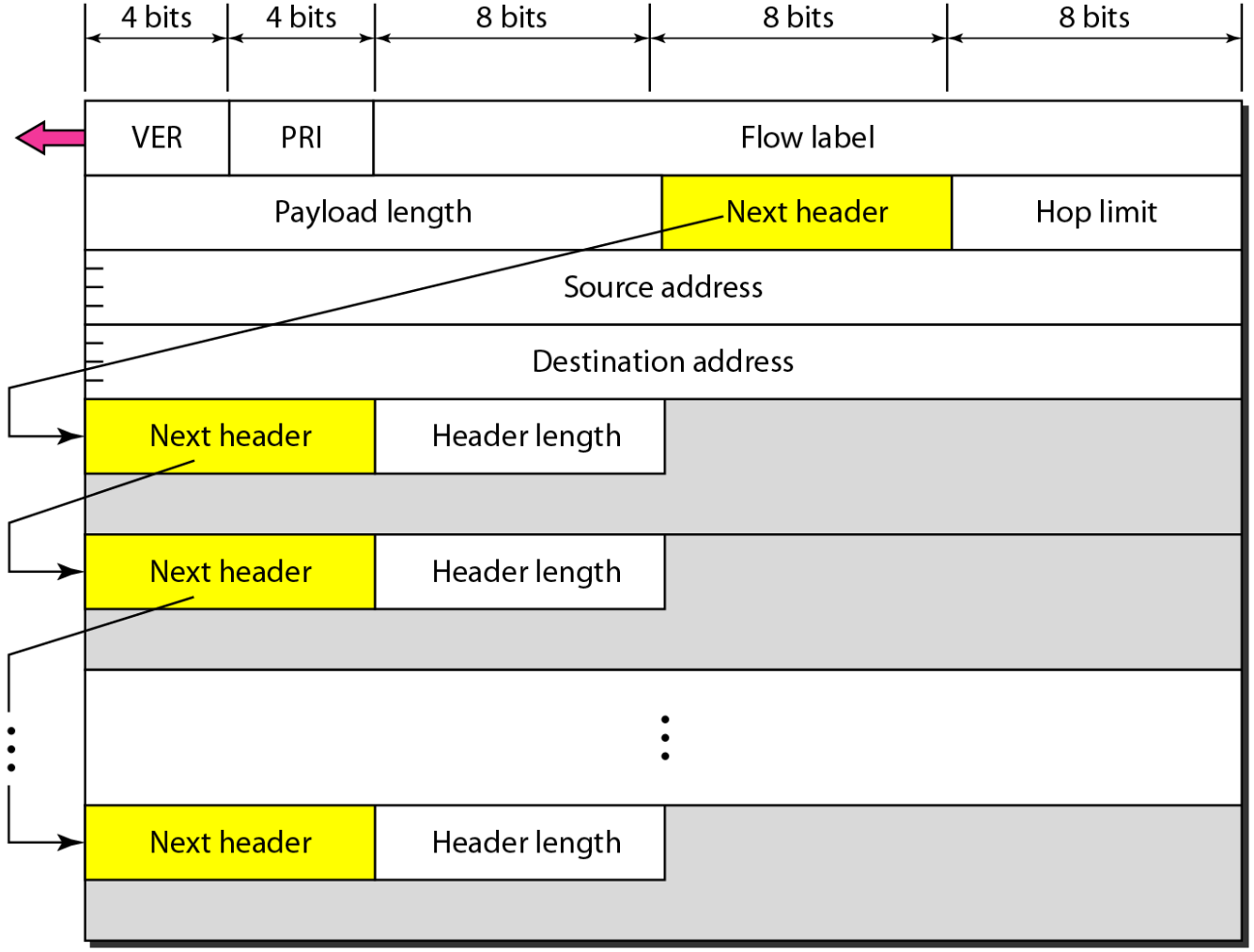
Need for fair and equitable policies for the management/allocation on IPv6

Current & future challenges of wireless Internet require IPv6

IP v6 Frame Format: IPv6 datagram header and payload



Format of an IPv6 datagram



PSIT
Kanpur

Next header codes for IPv6

Code	*Next Header*
0	Hop-by-hop option
2	ICMP
6	TCP
17	UDP
43	Source routing
44	Fragmentation
50	Encrypted security payload
51	Authentication
59	Null (no next header)
60	Destination option

Priorities for congestion-controlled traffic

Priority	*Meaning*
0	No specific traffic
1	Background data
2	Unattended data traffic
3	Reserved
4	Attended bulk data traffic
5	Reserved
6	Interactive traffic
7	Control traffic

Priorities for noncongestion-controlled traffic

Priority	*Meaning*
8	Data with greatest redundancy
. . .	. . .
15	Data with least redundancy

PSIT Kanpur

Comparison between IPv4 and IPv6 packet headers

Comparison
1. The header length field is eliminated in IPv6 because the length of the header is fixed in this version.
2. The service type field is eliminated in IPv6. The priority and flow label fields together take over the function of the service type field.
3. The total length field is eliminated in IPv6 and replaced by the payload length field.
4. The identification, flag, and offset fields are eliminated from the base header in IPv6. They are included in the fragmentation extension header.
5. The TTL field is called hop limit in IPv6.
6. The protocol field is replaced by the next header field.
7. The header checksum is eliminated because the checksum is provided by upper-layer protocols; it is therefore not needed at this level.
8. The option fields in IPv4 are implemented as extension headers in IPv6.