

ПРОЕКТИРАЊЕ И МЕНАЏМЕНТ НА КОМПЈУТЕРСКИ МРЕЖИ

- ВЕЖБИ 2 -

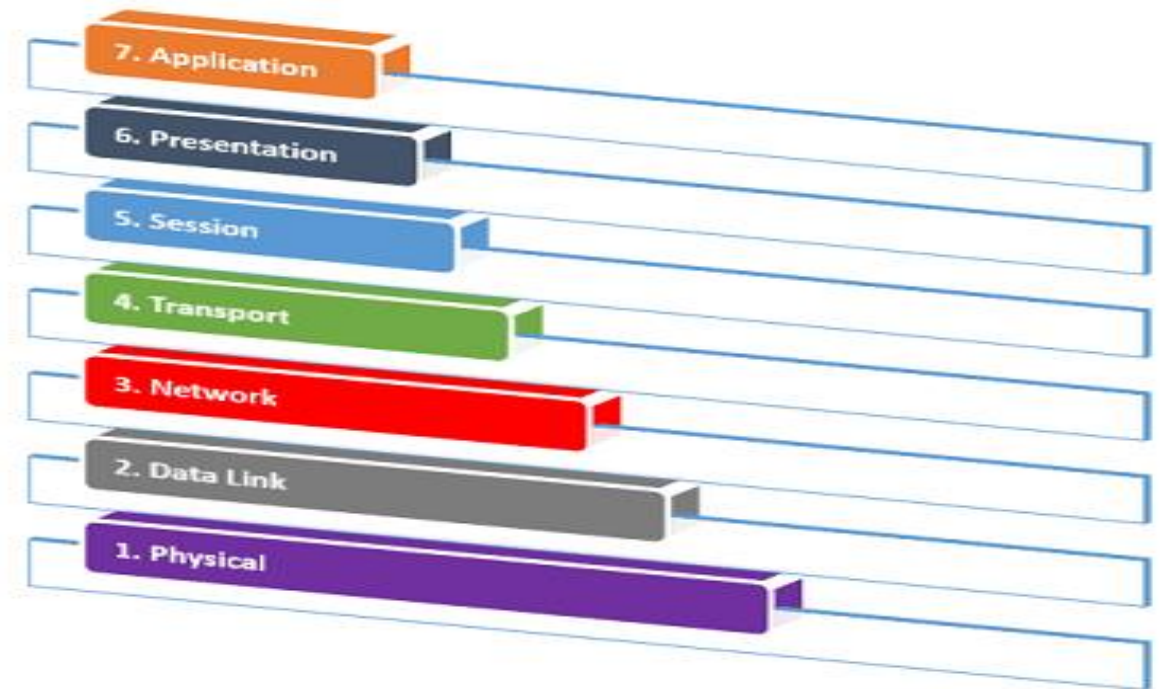


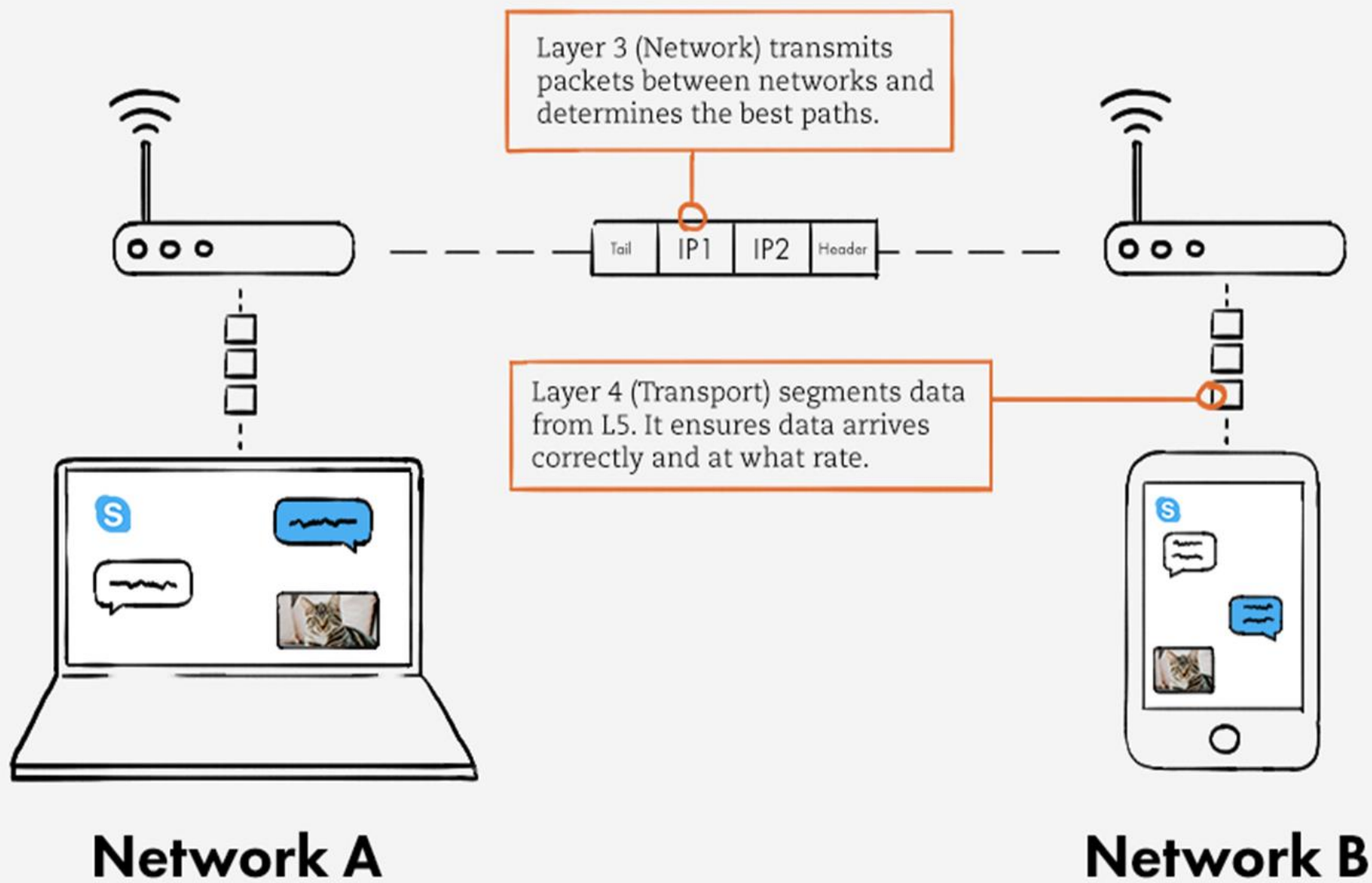
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АДРЕСИРАЊЕ –Прв дел

Содржина:

- Протоколи на Мрежен слој
- Задачи



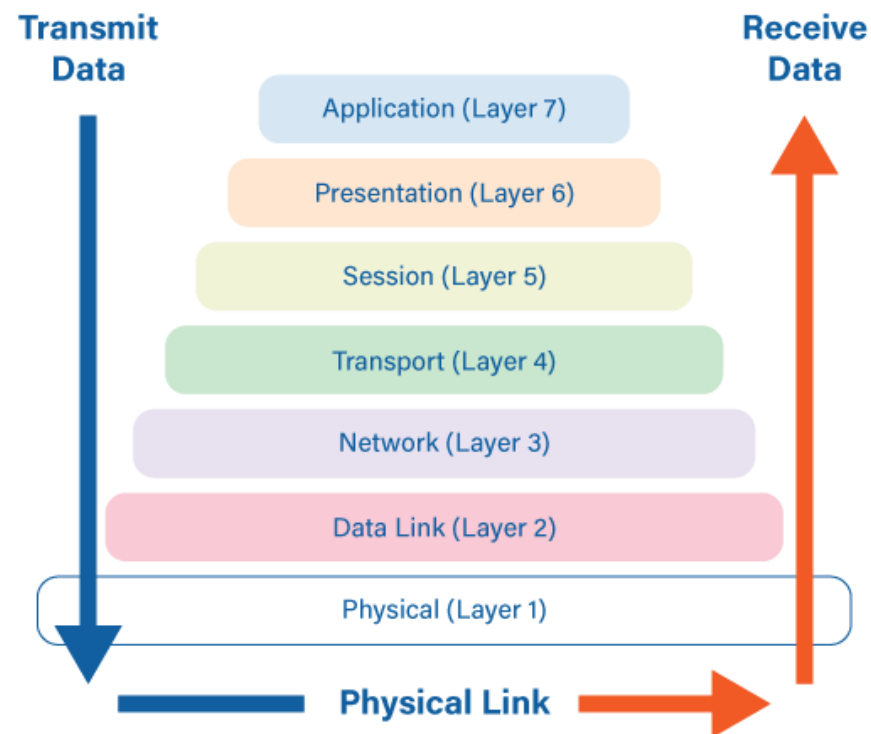


OSI МОДЕЛ

Моделот на Open Systems Interconnection (OSI) опишува седум слоеви кои компјутерските системи ги користат за да комуницираат преку мрежа.

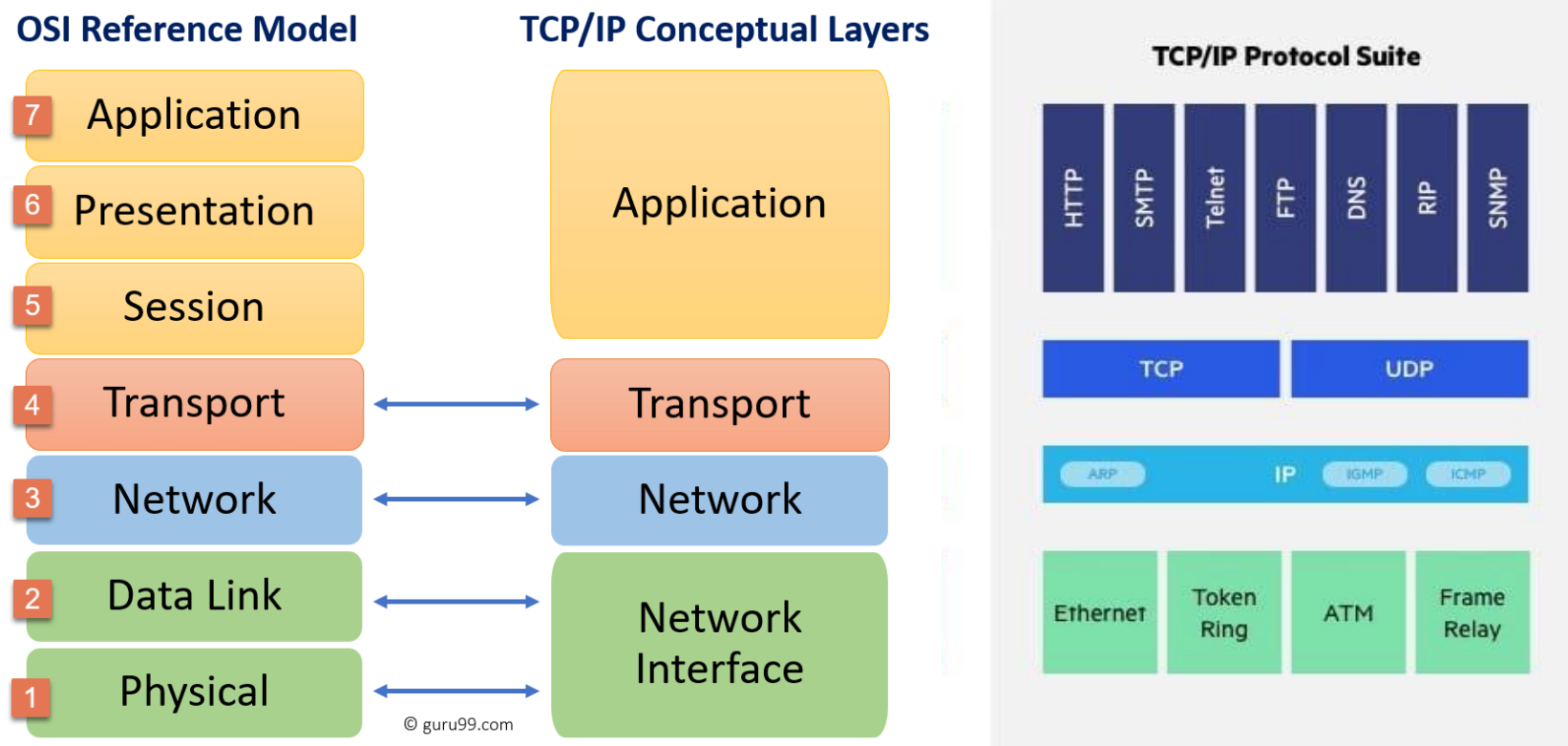


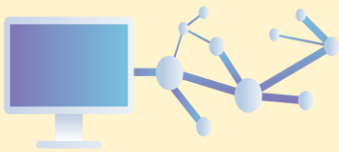
The 7 Layers of OSI



TCP/IP

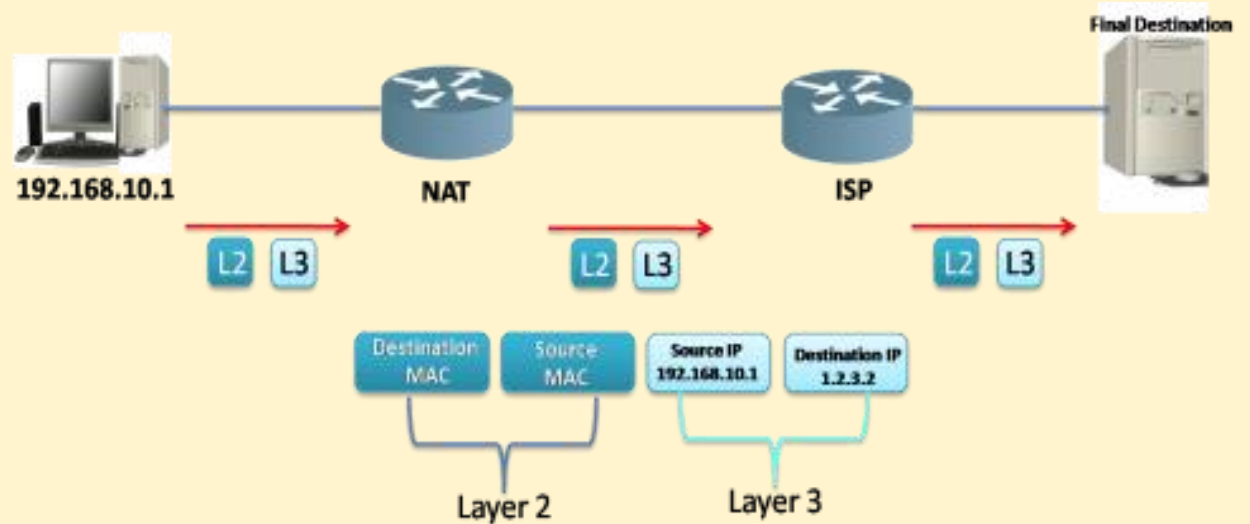
Протоколот за контрола на пренос/интернет протоколот (TCP/IP) е постар од моделот OSI. Клучната разлика помеѓу моделите е тоа што TCP/IP е поедноставен, собирајќи неколку OSI слоеви во еден:





Протоколи кои се користат кај Мрежниот слој:

- Internet Protocol version 4 (IPv4)
- Internet Protocol version 6 (IPv6)
- Novell Internetwork Packet Exchange (IPX)
- AppleTalk
- Connectionless Network Service (CLNS/DECNet)



TCP/IP базирани мрежи

Generating IP Packets

Transport Layer Encapsulation



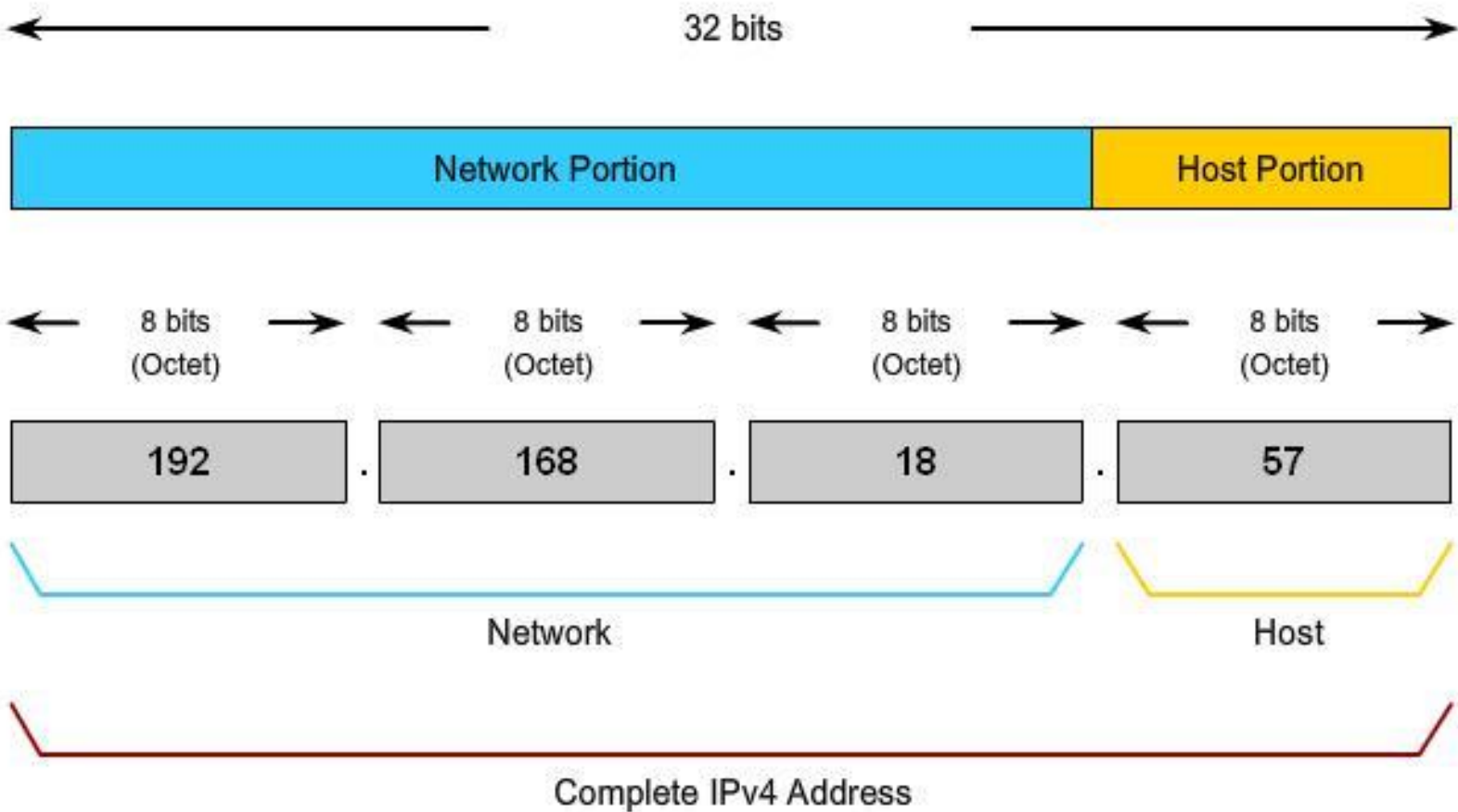
Network Layer Encapsulation



IP Packet

In TCP/IP based networks, the Network layer PDU is the IP packet.

Hierarchical IPv4 Address



Binary To Decimal Conversion

Exponent	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0							
Position	128	64	32	16	8	4	2	1							
Bits	1	1	1	1	0	1	0	1							
1 BYTE / 1 Octet															
Add these numbers together	128	+	64	+	32	+	16	+	0	+	4	+	0	+	1
Decimal	245														

A 1 in this position means 64 is added to the total.

A 0 in any position means that 0 is added to the total.

11110101 in Binary = Decimal Number 245

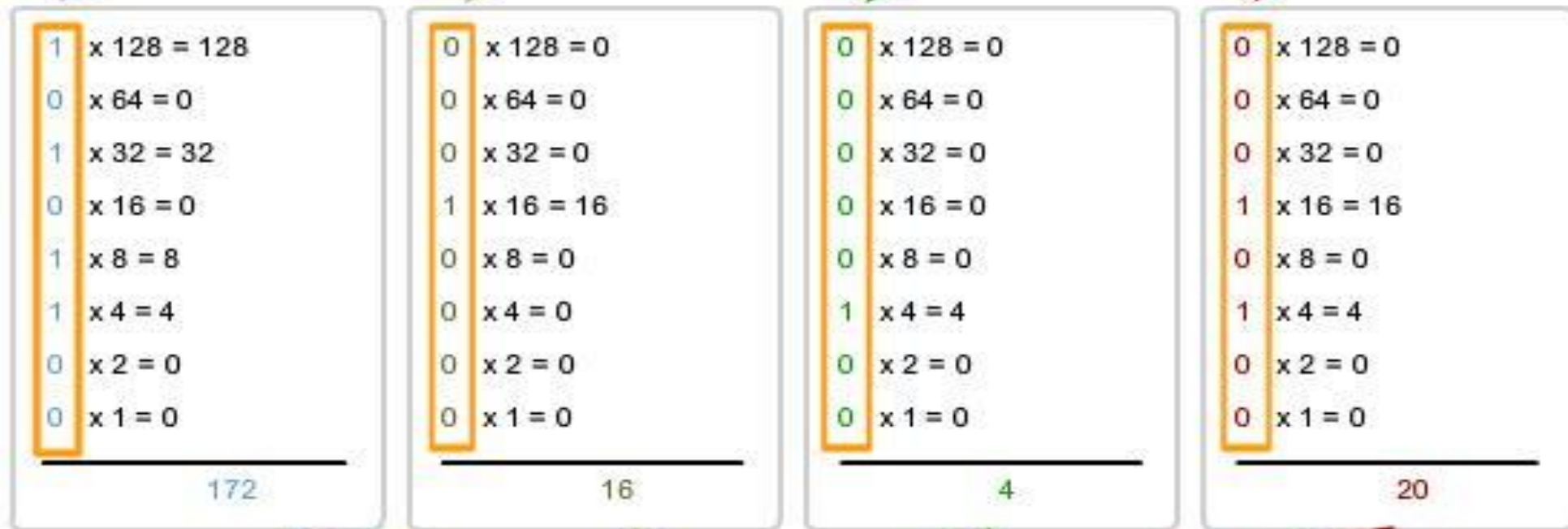
Converting an IPv4 from Binary to Dotted Decimal Notation

Binary IPv4 address 10101100000100000000010000010100

Divide the 32 bits into
4 octets



Convert each
octet to decimal



Each octet
decimal value is
separated by a
"."

Decimal IPv4 address

172.16.4.20

ЗАДАЧА 1:

1. Да се претстават следните IPv4 во декадна форма?

а)

11100100.00110101.01011010.10000010

б)

00001111.00011101.10000100.10110110

РЕШЕНИЕ НА ЗАДАЧА 1:

a) 11100100.00110101.01011010.10000010

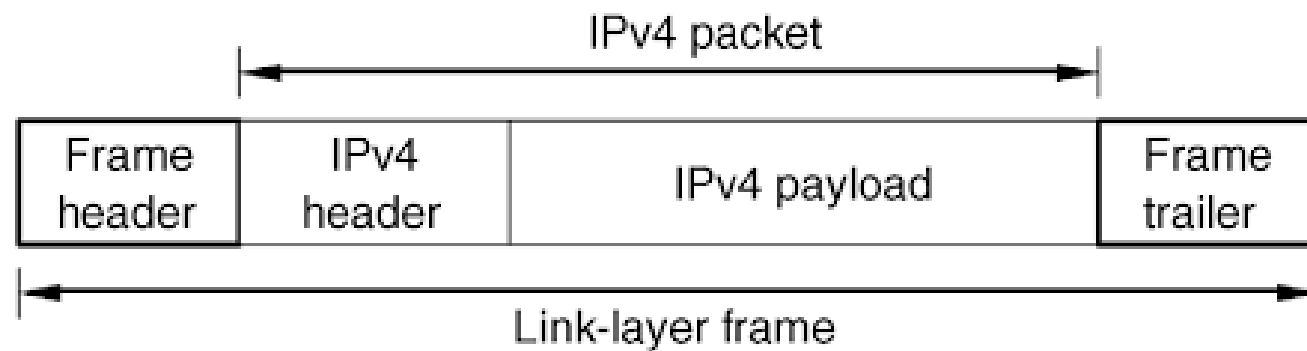
$$\begin{array}{cccccccc} 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 \\ 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \end{array} = 228$$

$$\begin{array}{cccccccc} 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \end{array} = 53$$

$$\begin{array}{cccccccc} 0 & 1 & 0 & 1 & 1 & 0 & 1 & 0 \\ 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \end{array} = 90$$

$$\begin{array}{cccccccc} 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \end{array} = 130$$

228 . 53 . 90 . 130



ЗАДАЧА 1:

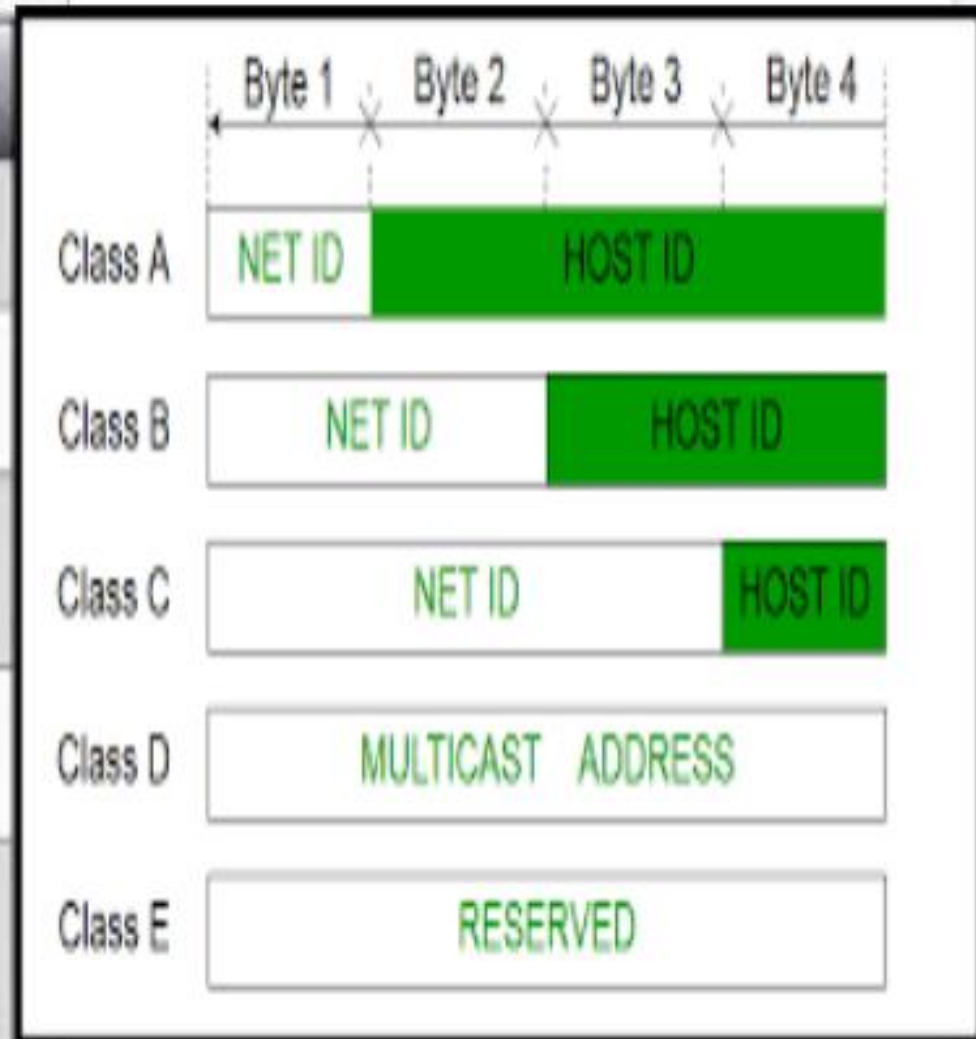
б)

00001111.00011101.10000100.10110110

15 . 29 . 132 . 182

Во изминатиов период, IP адресите биле поделени на 5 класи

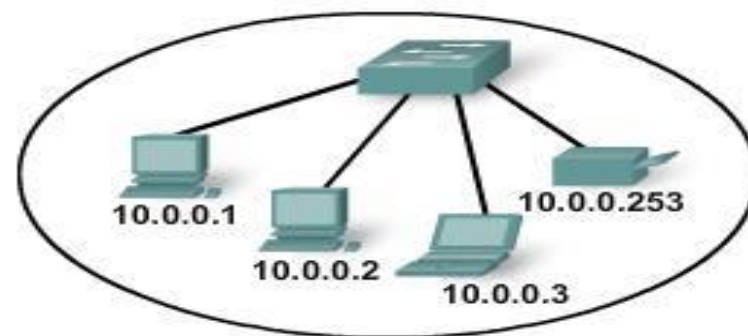
Address Class	Value in First Octet	Classful Mask (dotted decimal)	Classful Mask (prefix notation)
A	1 - 126	255.0.0.0	/8
B	128 - 191	255.255.0.0	/16
C	192 - 223	255.255.255.0	/24
D	224 - 239	N/A	N/A
E	240 - 255	N/A	N/A



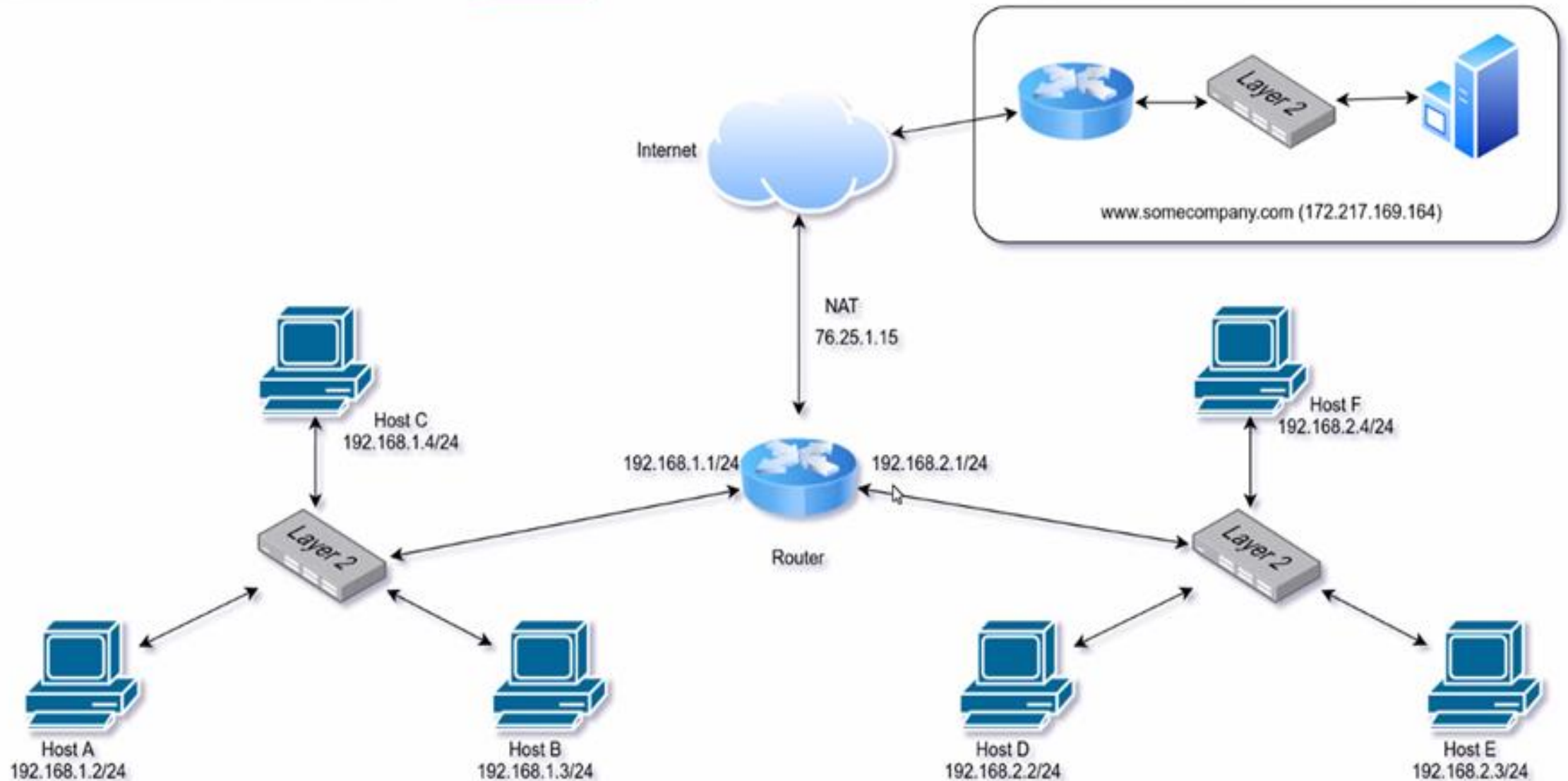
ТИПОВИ НА АДРЕСИ ВО ЕДНА IPV4 МРЕЖА

	Address Types		
	Network		Host
Network Address	10	0	0
	00001010	00000000	00000000
Broadcast Address	10	0	255
	00001010	00000000	11111111
Host Address	10	0	1
	00001010	00000000	00000001

Roll over to learn more.



Computer Networks basics



ЗАДАЧА 2:

155 . 78 . 125 . 215 /19

10011011.01001110.011/ 11101. 11010111

Да се најдат:

- a) Network address
- b) Broadcast address
- c) First host address
- d) Last host address

РЕШЕНИЕ НА ЗАДАЧА 2:

155 . 78 . 125 . 215 /19

10011011.01001110.011/ 11101. 11010111

a) Network address

155 . 78 . 96 . 0

10011011. 01001110. 011/ 00000. 00000000

b) Broadcast address

155 . 78 . 127 . 255

10011011. 01001110. 011/ 11111. 11111111

РЕШЕНИЕ НА ЗАДАЧА 2:

155 . 78 . 125 . 215 /19

10011011. 01001110. 011/ 11101. 11010111

c) First host address:

155 . 78 . 96 . 1

10011011. 01001110. 011/ 00000. 00000001

d) Last host address:

155 . 78 . 127 . 254

10011011. 01001110. 011/ 11111. 11111110

ЗАДАЧА 3:

138 . 120. 197. 159 /28

10001010. 01111000. 11000101. 1001 / 1111

Да се најдат:

- a) Network address
- b) Broadcast address
- c) First host address
- d) Last host address

РЕШЕНИЕ НА ЗАДАЧА 3:

138 . 120 . 197 . 159 /28

10001010. 01111000. 11000101. 1001 / 1111

a) Network address:

138 . 120 . 197 . 144

10001010. 01111000. 11000101. 1001 / 0000

b) Broadcast address:

138 . 120 . 197 . 159

10001010. 01111000. 11000101. 1001 / 1111

РЕШЕНИЕ НА ЗАДАЧА 3:

138 . 120 . 197 . 159 /28

10001010. 01111000. 11000101. 1001 / 1111

c) First host address:

138 . 120 . 197 . 145

10001010. 01111000. 11000101. 1001 / 0001

d) Last host address:

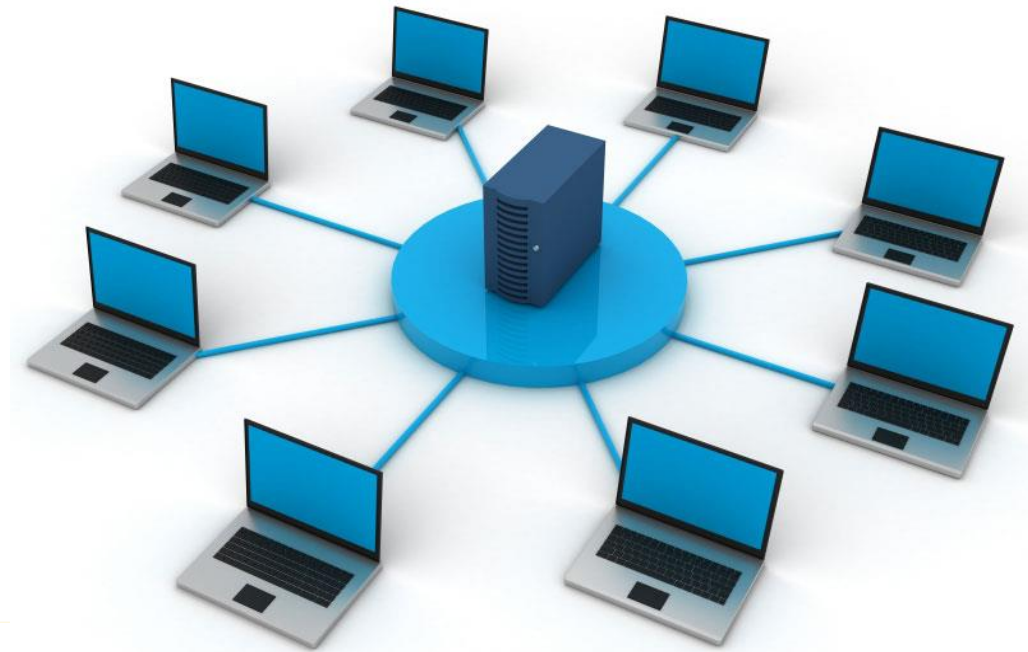
138 . 120 . 197 . 158

10001010. 01111000. 11000101. 1001 / 1110

IP АДРЕСИ

Приватни IPv4 адресни опсези [RFC 1918](#):

- 10.0.0.0 - 10.255.255.255 (10/8 prefix)
- 172.16.0.0 - 172.31.255.255 (172.16/12 prefix)
- 192.168.0.0 - 192.168.255.255 (192.168/16 prefix)



Јавни адреси (Public Addresses)
Пр.: 209.191.122.70

ЗАДАЧА 5: ДОМАШНА РАБОТА

172 . 128. 124. 18 /18

Да се најдат:

- a) Network address
- b) Broadcast address
- c) First host address
- d) Last host address