

380 → 512

200 → 256

$$120 \rightarrow 128$$

50 \rightarrow 64

20 → 32

172.64. - 1 - - - - 1/1 - . - - - -

380 hosts \rightarrow 172.64.64.0/23

172.64. - 1 - - - - 1 | 1 | . - - - - -

200 hosts \rightarrow 172.64.66.0/24

$$122.64.67. \begin{array}{|c|} \hline 0 \\ \hline 1 \end{array} - - - - -$$

120 hosts \rightarrow 122.64.67.0/25

$$122.64.67. \frac{1}{[0]} - - - - -$$

50 hosts $\rightarrow 172.64.67.128/26$

$$122.64.67.\frac{1}{\underset{\uparrow}{0}} \frac{1}{1} | - - - -$$

20 hosts $\rightarrow 172.64.62.192/27$

6 subnets de router a router:

172. 64. 67. 224 / 30

172.64.67.228/30

172.64.67.232/30

172.64.67.236/30

172. 64. 67. 240/30

172. 64. 62. 244 | 30

1. Configure the addressing for the topology. Initial address: 172.64.64.0 255.255.252.0
2. Routing table for Router0 and Router5

Router 0

Destination Network	Next Hop
0.0.0.0/0	172.64.67.238
172.64.67.128/25	172.64.67.226
172.64.67.192/27	172.64.67.233

Router 5

Destination Network	Next Hop
0.0.0.0/0	172.64.67.237
172.64.66.0/24	172.64.67.246

3. Assume ARP cache at the hosts and routers are empty initially.

- a. PC9 send a datagram to PC8.
- b. Fill in the fields corresponding to the Ethernet header and ARP header for the request and ARP response

REQUEST

Ethernet Header

Source address: 10:20:30:40:50:60

Destination address: FF:FF:FF:FF:FF:FF

ARP header

Protocol type: 0x0806 (ARP)

Source hardware address: 10:20:30:40:50:60

Source protocol address: 172.64.66.3

Target hardware address: 00:00:00:00:00:00

Target protocol address: 172.64.66.2

RESPONSE

Ethernet Header

Source address: 01:02:03:04:05:06

Destination address: 10:20:30:40:50:60

ARP header

Protocol type: 0x0806 (ARP)

Source hardware address: 01:02:03:04:05:06

Source protocol address: 172.64.66.2

Target hardware address: 10:20:30:40:50:60

Target protocol address: 172.64.66.3

C. Repeat the process if PC9 sends a datagram to PC7

REQUEST

Ethernet Header

Source address: aa:bb:cc:dd:ee:ff

Destination address: FF:FF:FF:FF:FF:FF

ARP header

Protocol type: 0×0806 (ARP)
Source hardware address: $aa:bb:cc:dd:ee:ff$
Source protocol address: $172.64.67.129$
Target hardware address: $00:00:00:00:00:00$
Target protocol address: $172.64.66.2$

RESPONSE

Ethernet Header

Source address: $01:02:03:04:05:06$
Destination address: $aa:bb:cc:dd:ee:ff$

ARP header

Protocol type: 0×0806 (ARP)
Source hardware address: $01:02:03:04:05:06$
Source protocol address: $172.64.66.2$
Target hardware address: $aa:bb:cc:dd:ee:ff$
Target protocol address: $172.64.67.129$

4. You want to send a datagram of 1500 bytes from PC4 to PC5. The datagram has an identifier with value: 522

Show how the fragmentation remains after passing each of the routers.

Datagram \rightarrow 1500 ID = 522

MTU = 1500 \rightarrow No fragmentation $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 0 \\ \text{MF} = 0 \end{array} \right.$

MTU = 8000 \rightarrow No fragmentation $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 0 \\ \text{MF} = 0 \end{array} \right.$

MTU = 600 $\rightarrow 600 - 20 = 580$

1. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 0 \\ \text{Longitud} = 580 \\ \text{MF} = 1 \end{array} \right.$
2. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 580/8 = 72 \\ \text{Longitud} = 580 \\ \text{MF} = 1 \end{array} \right.$
3. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 1160/8 = 145 \\ \text{Longitud} = 340 \\ \text{MF} = 0 \end{array} \right.$

MTU = 400 $\rightarrow 400 - 20 = 380$

1. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 0 \\ \text{Longitud} = 376 \\ \text{MF} = 1 \end{array} \right.$ \downarrow
376
2. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 376/8 = 47 \\ \text{Longitud} = 204 \\ \text{MF} = 0 \end{array} \right.$
3. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 376/8 = 47 + 47 = 94 \\ \text{Longitud} = 376 \\ \text{MF} = 1 \end{array} \right.$
4. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 376/8 = 47 + 94 = 141 \\ \text{Longitud} = 204 \\ \text{MF} = 0 \end{array} \right.$
5. $\left\{ \begin{array}{l} \text{ID} = 522 \\ \text{OF} = 145 \\ \text{Longitud} = 340 \\ \text{MF} = 0 \end{array} \right.$