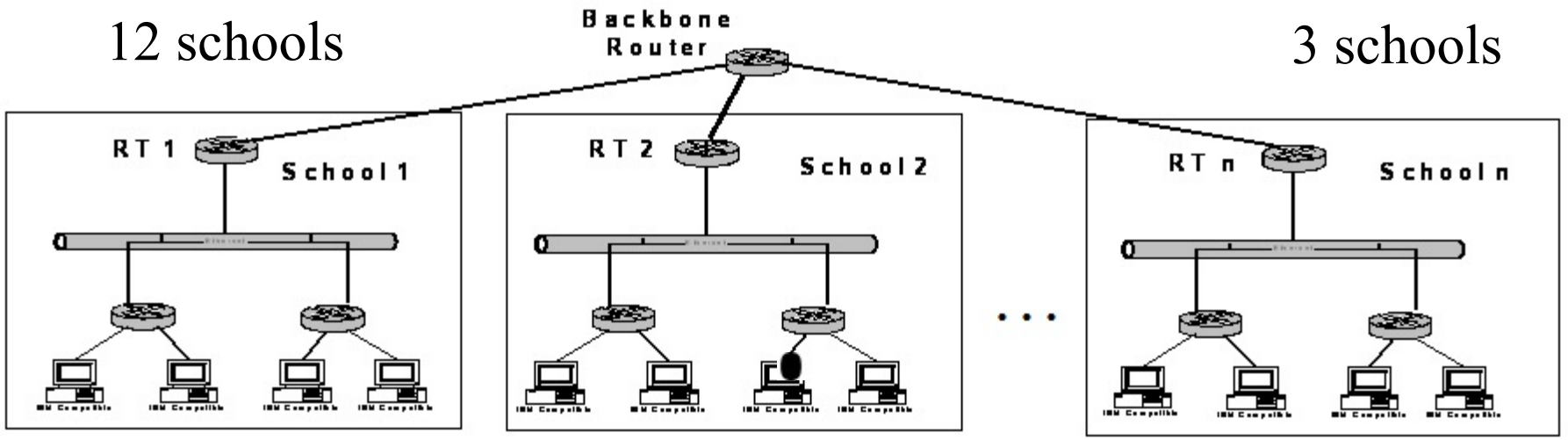
SC2008
CE3005:Computer Networks
CZ3006: Netcentric Computing

IP addressing

Q1: Assign suitable subnet address/subnet mask



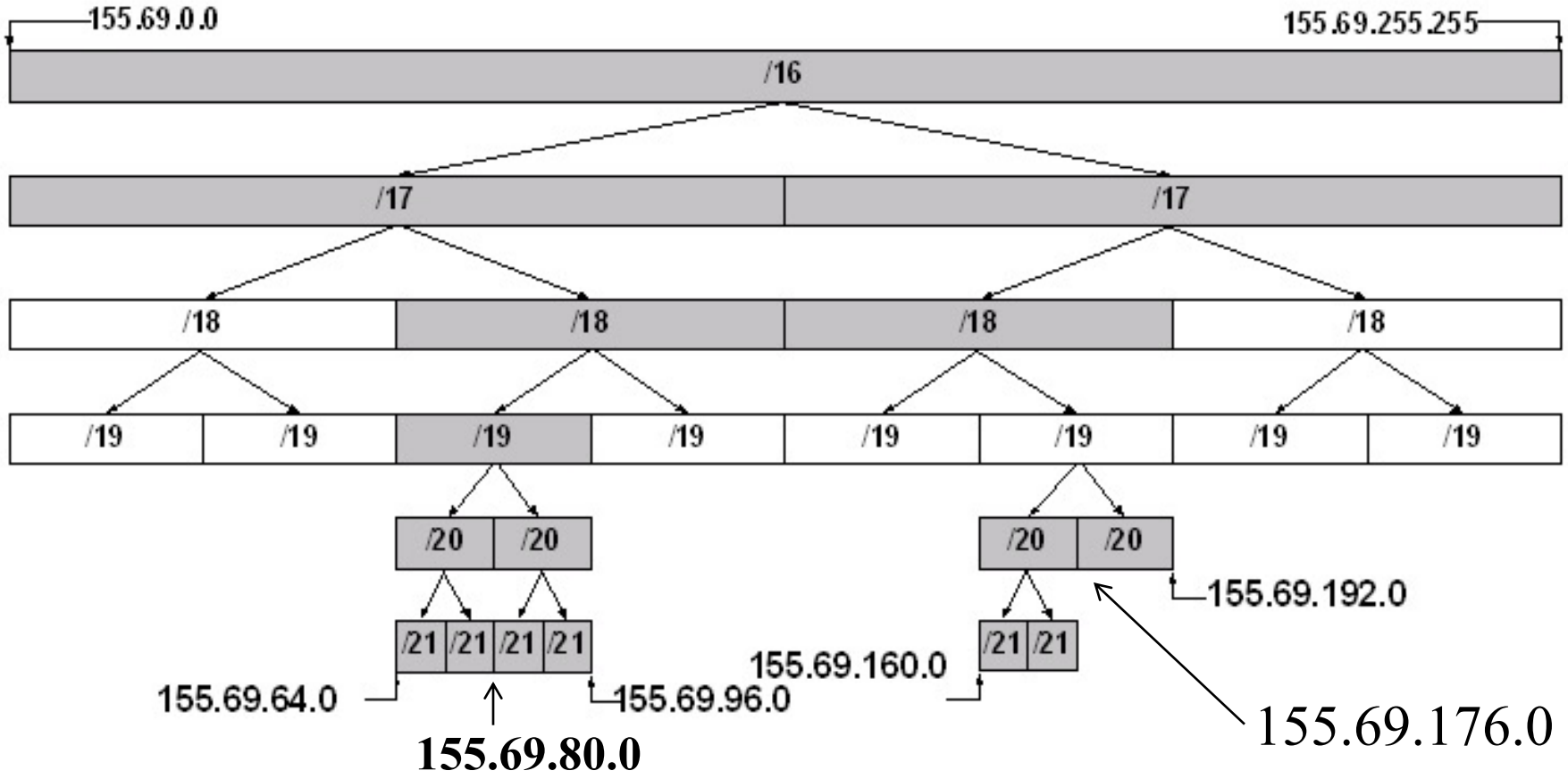
Note:

IP block: 155.69.0.0/16

If using /20 mask, # of hosts = 2^{12} - 2 = 4094

If using /21 mask, # of hosts = 2^{11} - 2= 2046

Q1: Assign suitable subnet address/subnet mask



In this /16 network, there can be 16 subnets with /20 masks, or 32 subnets with /21 masks.

Subnet mask :/20 255.255.11110000.0

Q1: Assign suitable subnet address/subnet mask

- You can choose
  - any 3 address blocks with /20, e.g.
    - 155.69.0.0/20 : 155.69.0.0 till 155.69.15.255
    - 155.69.16.0/20 :155.69.16.0 till 155.69.31.255
    - 155.69.32.0/20 :155.69.32.0. till 155.69.47.255
  - any 12 address blocks with /21, e.g.
    - 155.69.64.0/21 : 155.69.64.0 till 155.69.71.255
    - 155.69.72.0/21 : 155.69.72.0 till 155.69.79.255
    - …
  - Remember not to overlap the address block

How much address is left ? 7 blocks of /20

Q2: Broadcast Address of a Subnet

An organization is assigned a /16 IP address block. The organization has created several subnets for its network. It is known that one of the subnets is 145.32.128.0/255.255.224.0. What is the broadcast address for this subnet?

Given subnet address/subnet mask:

Dotted decimal:	145.32.128.0	/	255.255.224.0
In binary:	145.32.10000000.0	/	255.255.11100000.0

Q2: Broadcast Address of a Subnet

Given subnet address/subnet mask:

Dotted decimal: 145.32.128.0 / 255.255.224.0

In binary: 145.32.10000000.0 / 255.255.11100000.0

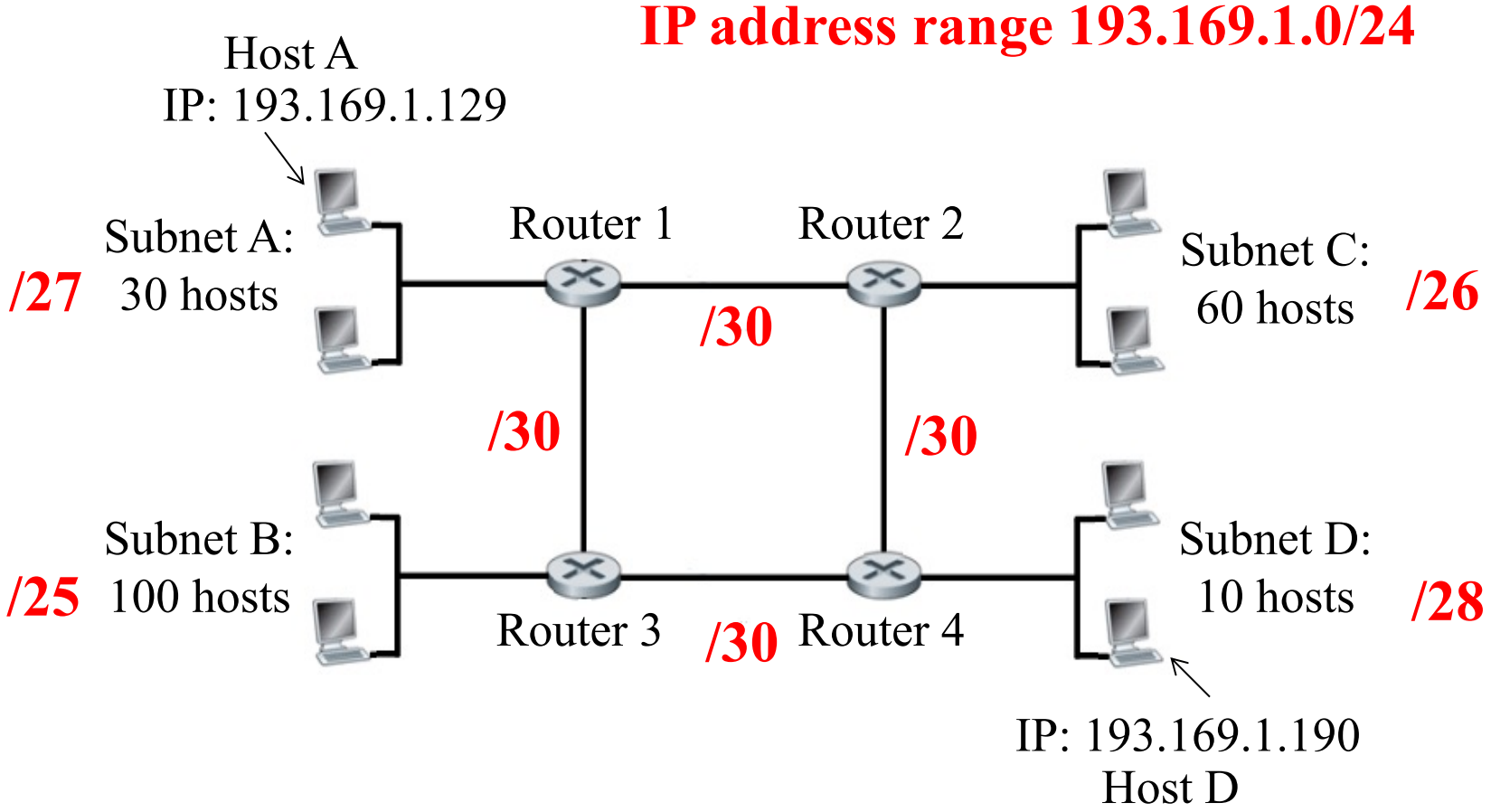
So, broadcast address of subnet 145.32.128.0/19:

In binary: 145.32.10011111.11111111

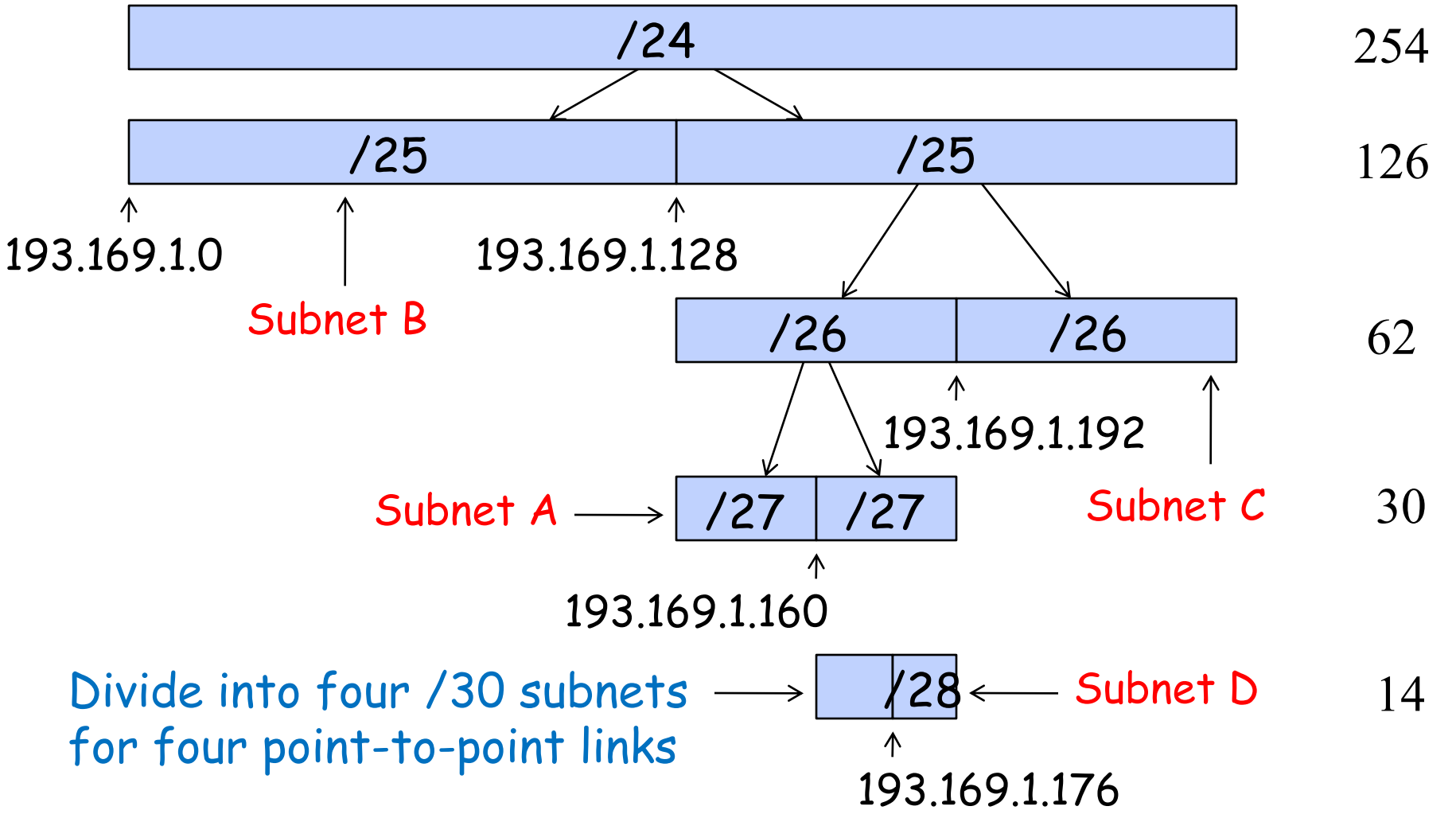
Dotted decimal: 145.32.159.255

Q3: Assign suitable IP addresses/subnet masks

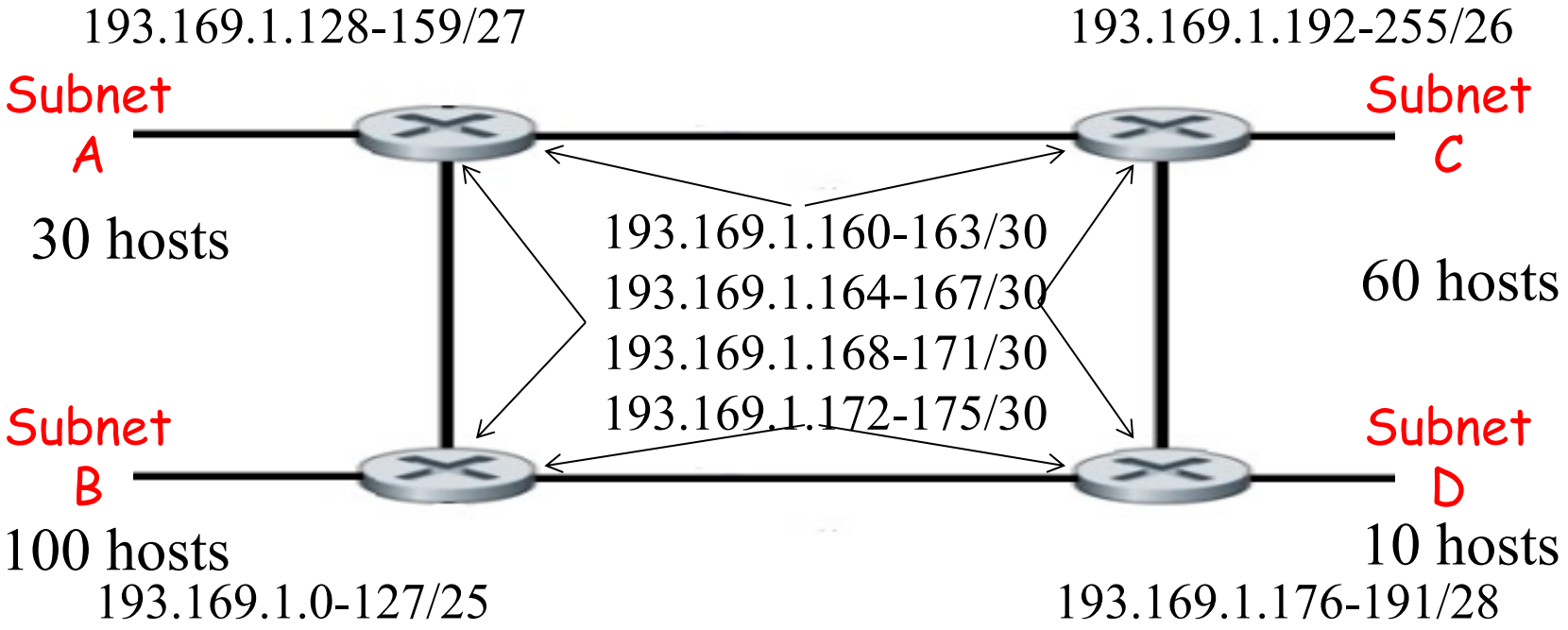
Remember that all hosts/routers in a subnet must have the same subnet id.



Q3: Assign suitable IP addresses/subnet masks



Q3: Assign suitable IP addresses/subnet masks



Q4: IP Header

Consider sending a 3000 byte datagram into a link that has an MTU of 500 bytes. Suppose the original datagram is stamped with the identification number 422. How many fragments are generated? What are their characteristics?

Q4: IP Header

Consider sending a 3000 byte datagram into a link that has an MTU of 500 bytes. Suppose the original datagram is stamped with the identification number 422. How many fragments are generated? What are their characteristics?

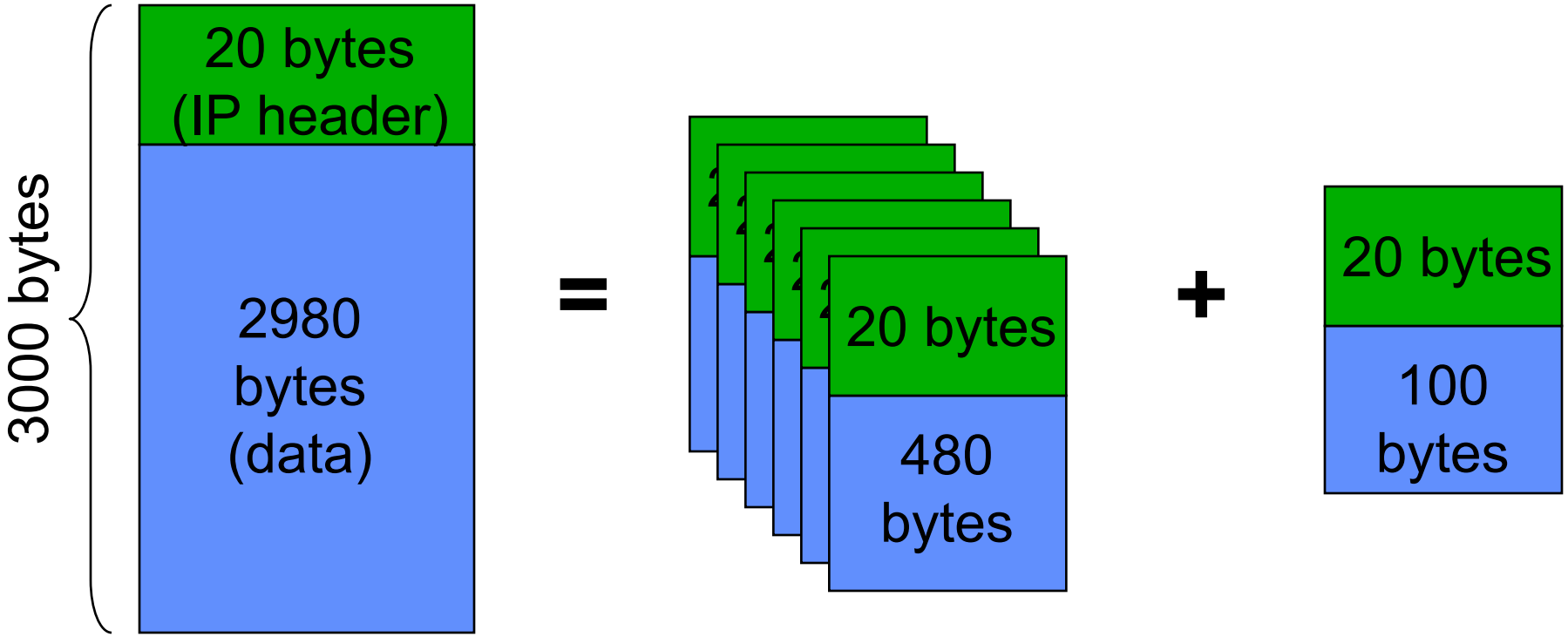
Size of the datagram = 3000 bytes

Total data in the datagram = 2980 bytes

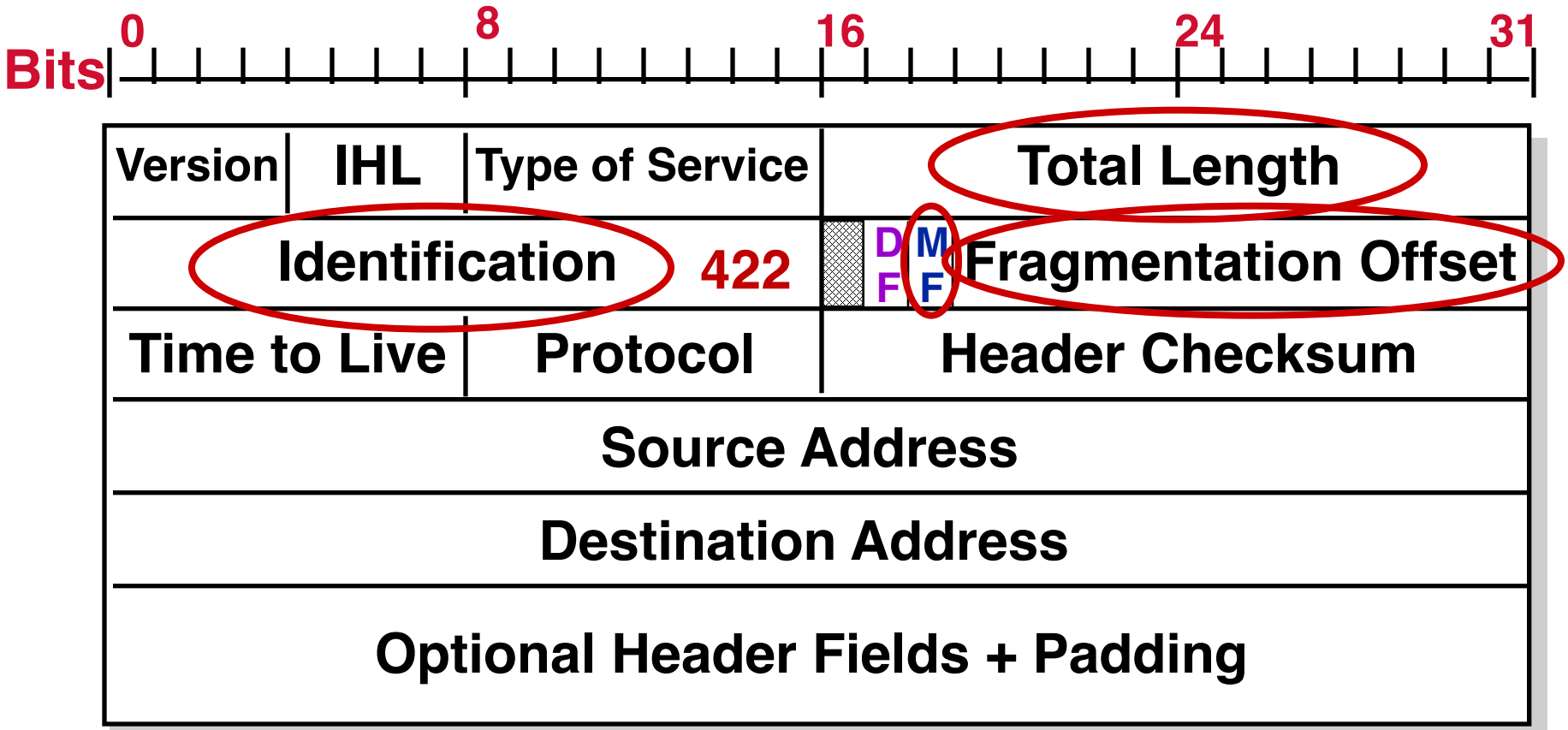
Max. data in each fragment = 500 - 20 = 480 bytes

Number of fragments = 2980 / 480 = 6.21, i.e., 7 fragments

Q4: IP Fragmentation



Q4: IP Header

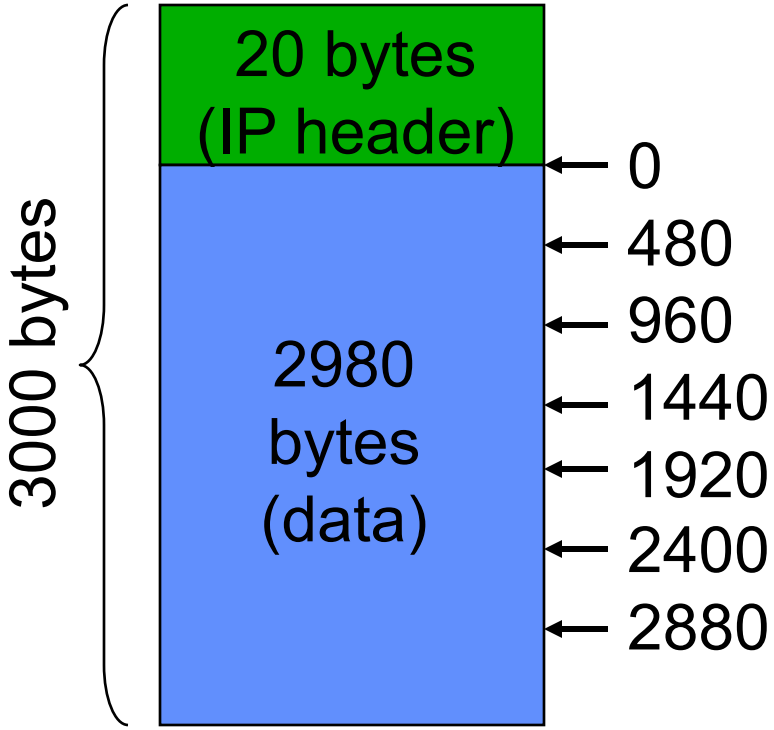


DF: Don't Fragment

MF: More Fragments

Bit not used

Q4: IP Fragmentation



Fragment	length	ID	MF	offset
1	500	422	1	0
2	500	422	1	60
3	500	422	1	120
4	500	422	1	180
5	500	422	1	240
6	500	422	1	300
7	120	422	0	360

‘offset’ is in 8-byte unit

(ie 60 means 60*8 = 480 bytes)

In addition to the office hours listed in the previous slide, please feel free to contact Assistant Professor Jun ZHAO as follows to schedule appointments to ask questions. Thanks!

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