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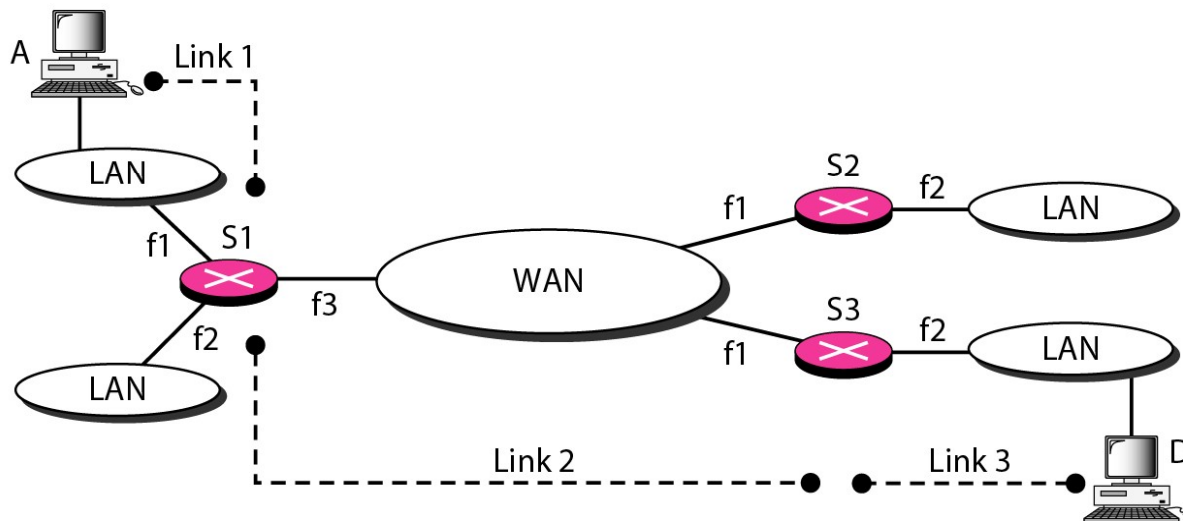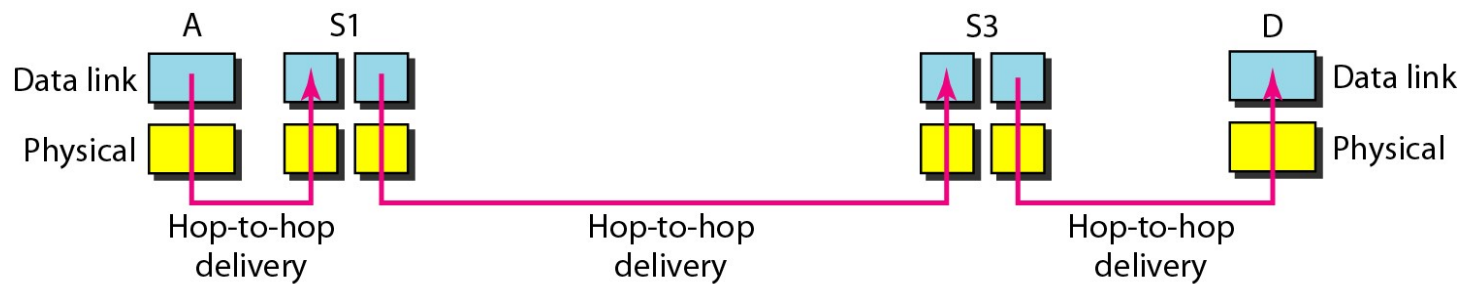
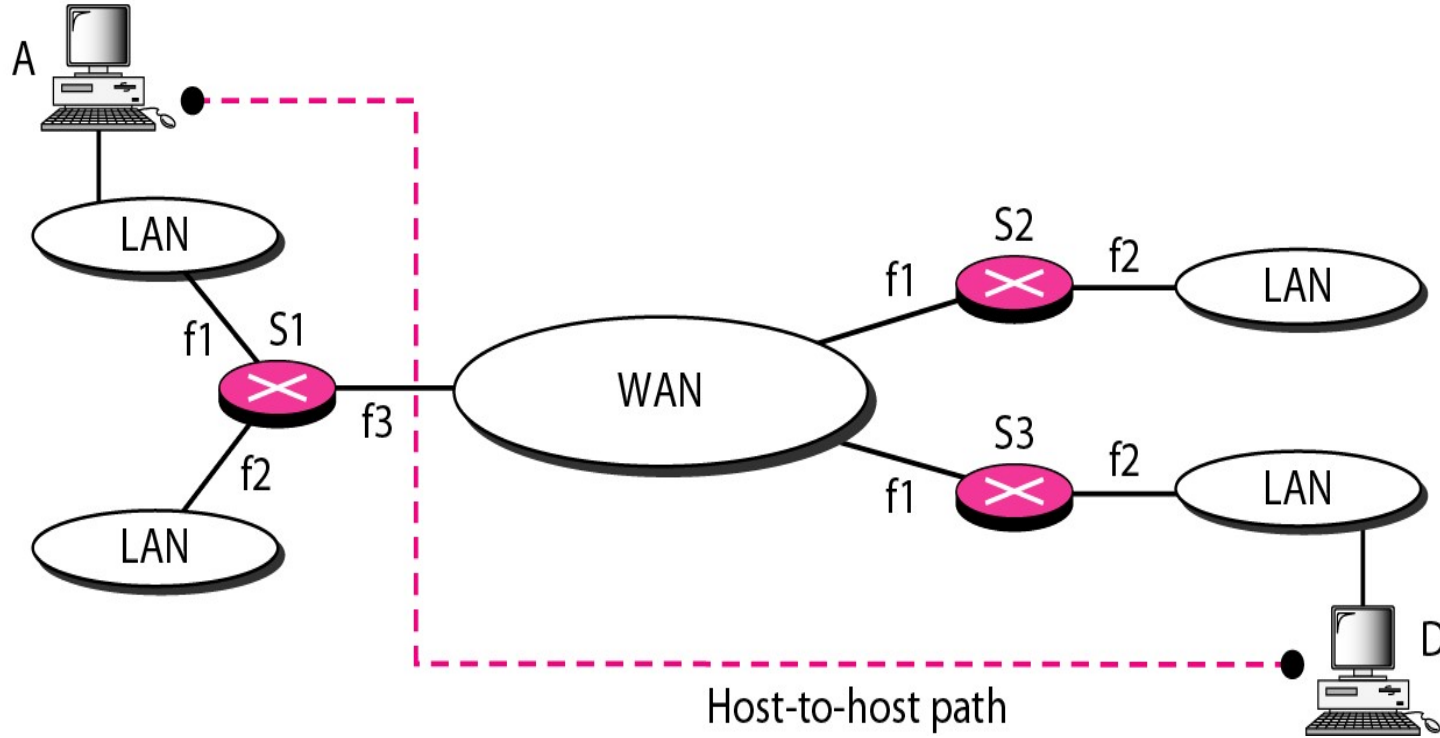# RTMENT OF INFORMATION TECHNOLOGY

16IT301 – COMPUTER NETWORKS

II YEAR IV SEM

NIT 3 – INTERNETWORKING AND ROUTING

TOPIC 16 –IP (IPv4)

networking, *connecting* networks together to make an

network or an internet.

A   S1

Network

Data link

Physical

S3   D

Network

Data link

Physical

A

LAN

f1   S1

f2

LAN

f3

WAN

S2   f1   f2

LAN

S3   f1   f2

LAN

D

Host-to-host path

Data from
another protocol

Source

Routing
table

Processing

IP packet
and routing
information

Network layer

To data
link layer
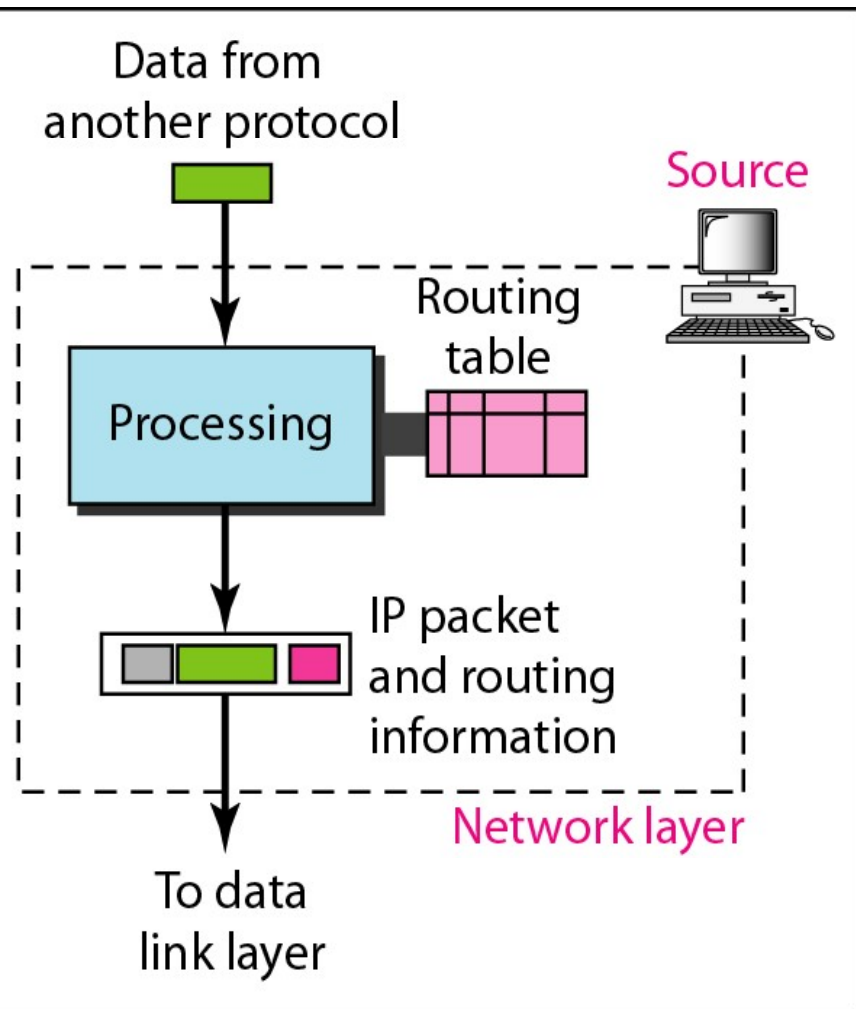
a. Network layer at source

Destination

Data to
another protocol

Processing

IP
packet

Network layer

From data
link layer
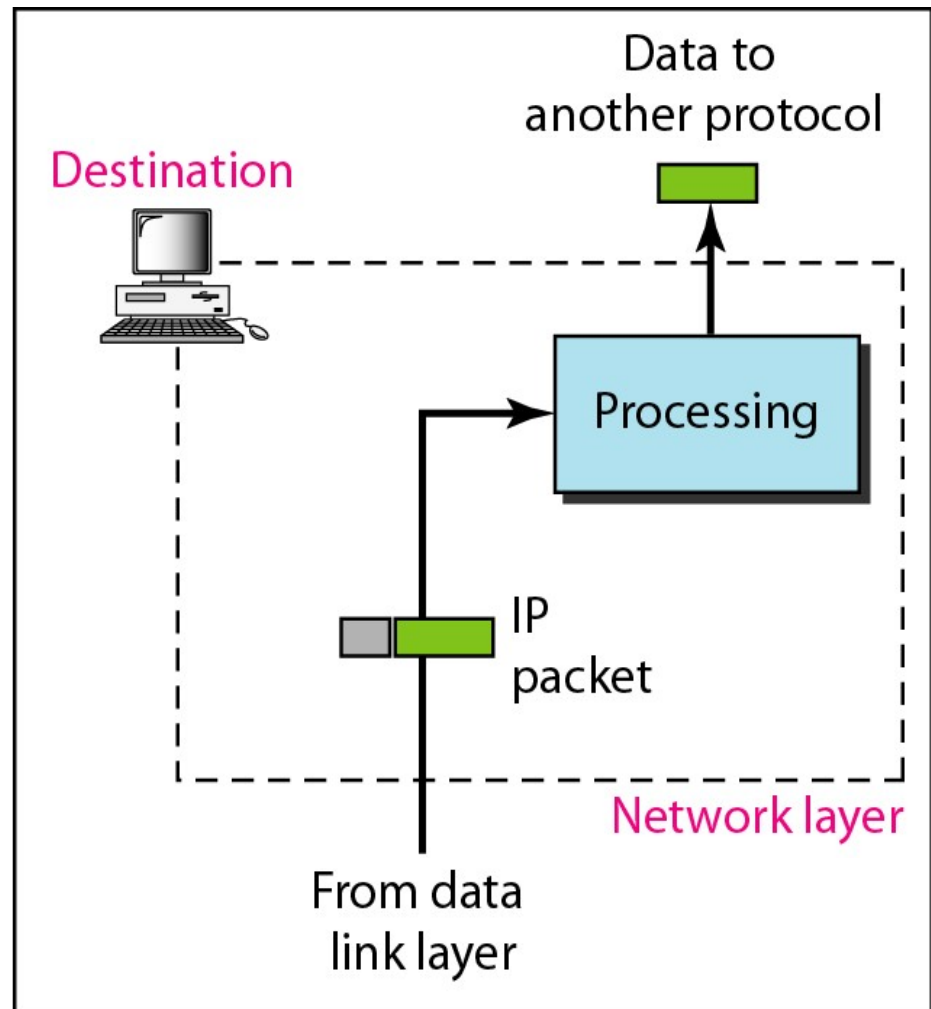
b. Network layer at destination

Internet Protocol version 4 (IPv4) is the delivery mechanism used by the TCP/IP protocols.

Application layer	SMTP	FTP	TFTP	DNS	SNMP	...	BOOTP

Transport layer	SCTP	TCP	UDP

Network layer: IGMP, ICMP, **IPv4**, ARP, RARP

Data link layer / Physical layer: Underlying LAN or WAN technology

IPv4 datagram format

D: Minimize delay   R: Maximize reliability

T: Maximize throughput   C: Minimize cost

| | | | D | T | R | C | |

Precedence   TOS bits

Service type

| | | | | | | | |

Codepoint
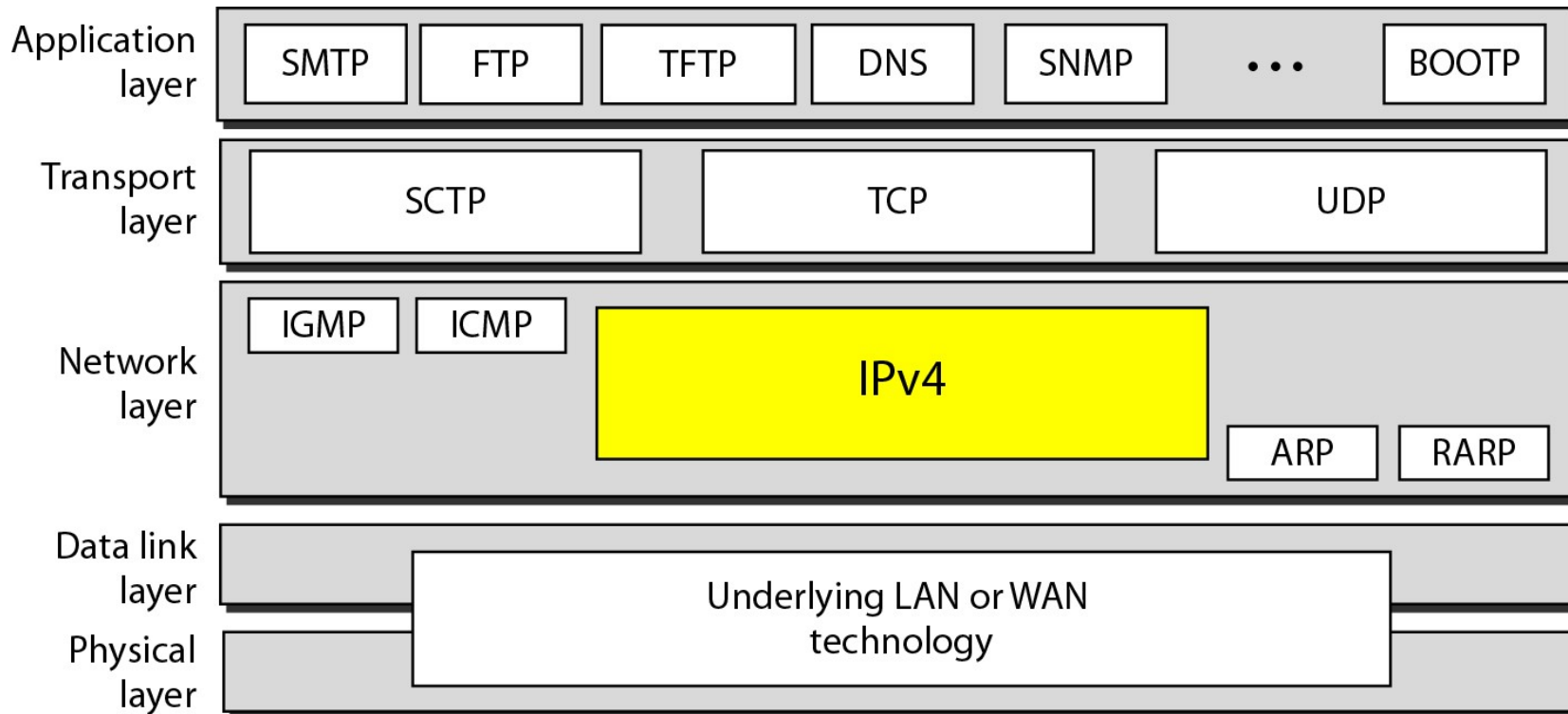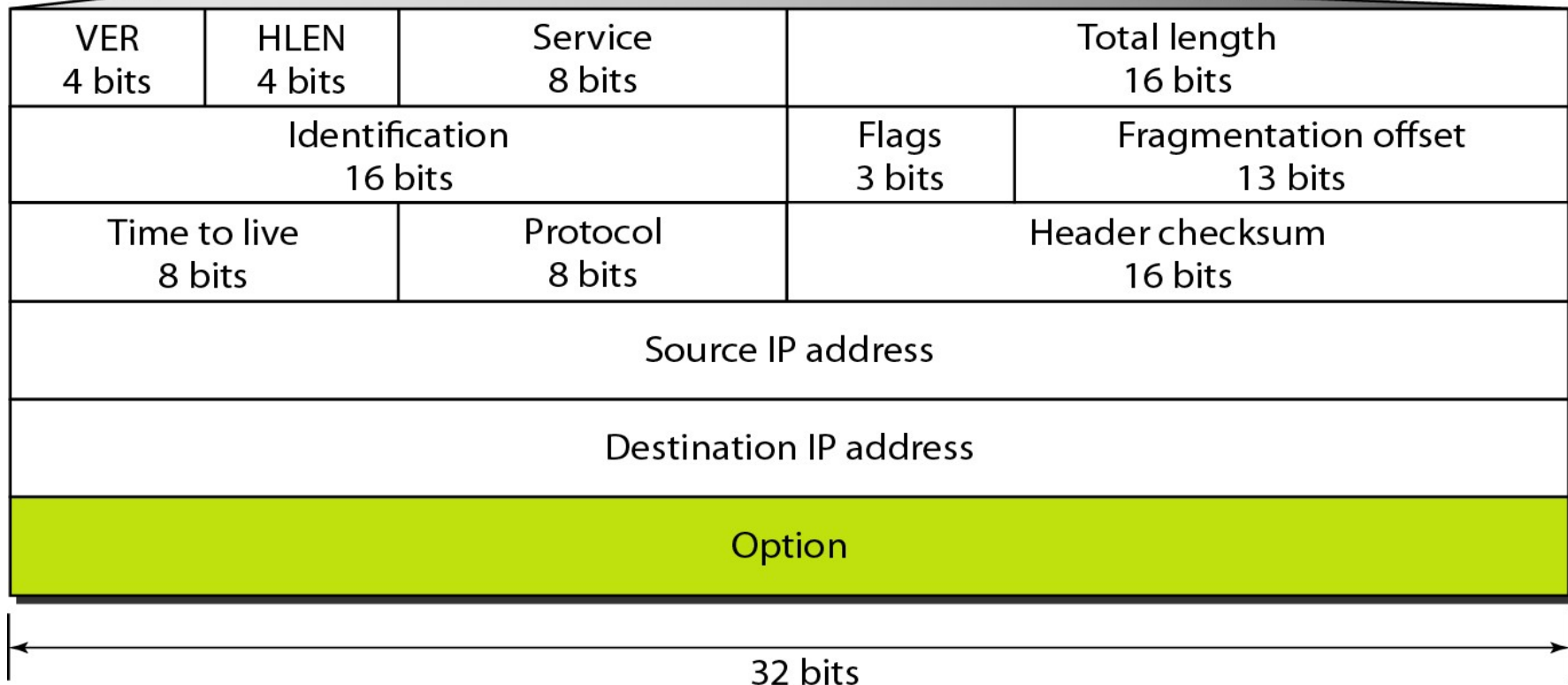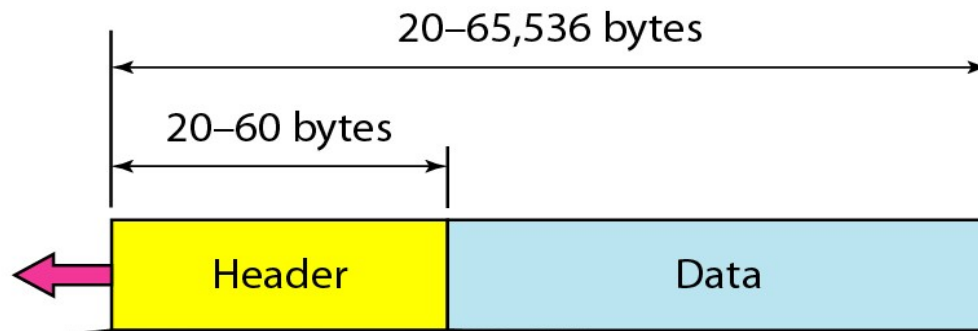
Differentiated services

TOS Bits	Description
0000	Normal (default)
0001	Minimize cost
0010	Maximize reliability
0100	Maximize throughput
1000	Minimize delay

```
                                                          ┌─────────────────┐
                                          ┌────────────┐  │  No operation   │
                               ┌──────────│ Single-byte│──┤                 │
                               │          └────────────┘  ├─────────────────┤
                               │                          │  End of option  │
        ┌────────────┐         │                          └─────────────────┘
        │            │         │
        │  Options   │─────────┤
        │            │         │                          ┌─────────────────┐
        └────────────┘         │                          │  Record route   │
                               │                          ├─────────────────┤
                               │          ┌────────────┐  │Strict source route│
                               └──────────│Multiple-byte│─┤                 │
                                          └────────────┘  ├─────────────────┤
                                                          │Loose source route│
                                                          ├─────────────────┤
                                                          │   Timestamp     │
                                                          └─────────────────┘
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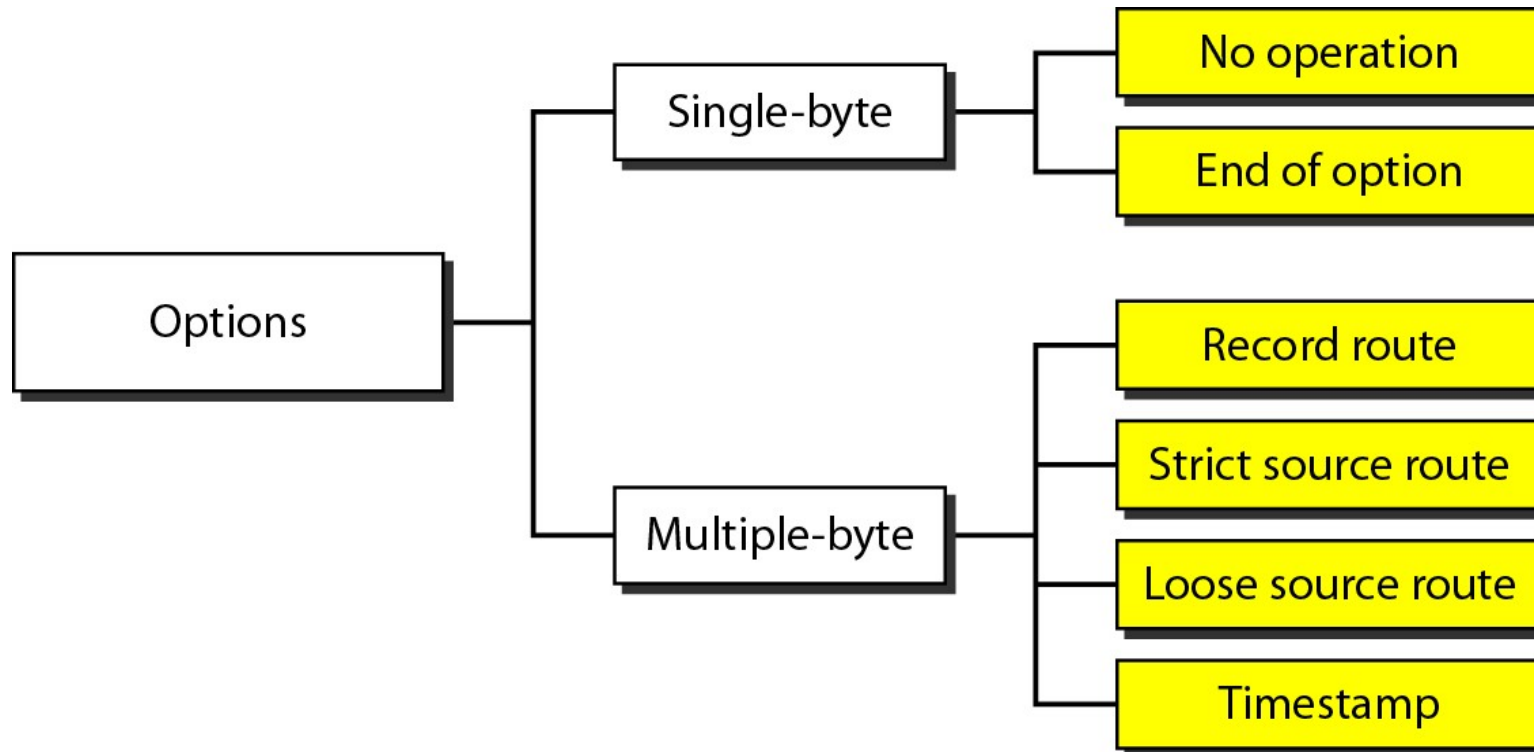
Default types of service

Protocol	TOS Bits	Description
ICMP	0000	Normal
BOOTP	0000	Normal
NNTP	0001	Minimize cost
IGP	0010	Maximize reliability
SNMP	0010	Maximize reliability
TELNET	1000	Minimize delay
FTP (data)	0100	Maximize throughput
FTP (control)	1000	Minimize delay
TFTP	1000	Minimize delay
SMTP (command)	1000	Minimize delay
SMTP (data)	0100	Maximize throughput
DNS (UDP query)	1000	Minimize delay
DNS (TCP query)	0000	Normal
DNS (zone)	0100	Maximize throughput

Value	Protocol
1	ICMP
2	IGMP
6	TCP
17	UDP
89	OSPF

Protocol field and encapsulated data

Transport layer	SCTP	TCP	UDP

Network layer — ICMP, IGMP, OSPF

Header

The value of the protocol field defines
to which protocol the data belong.
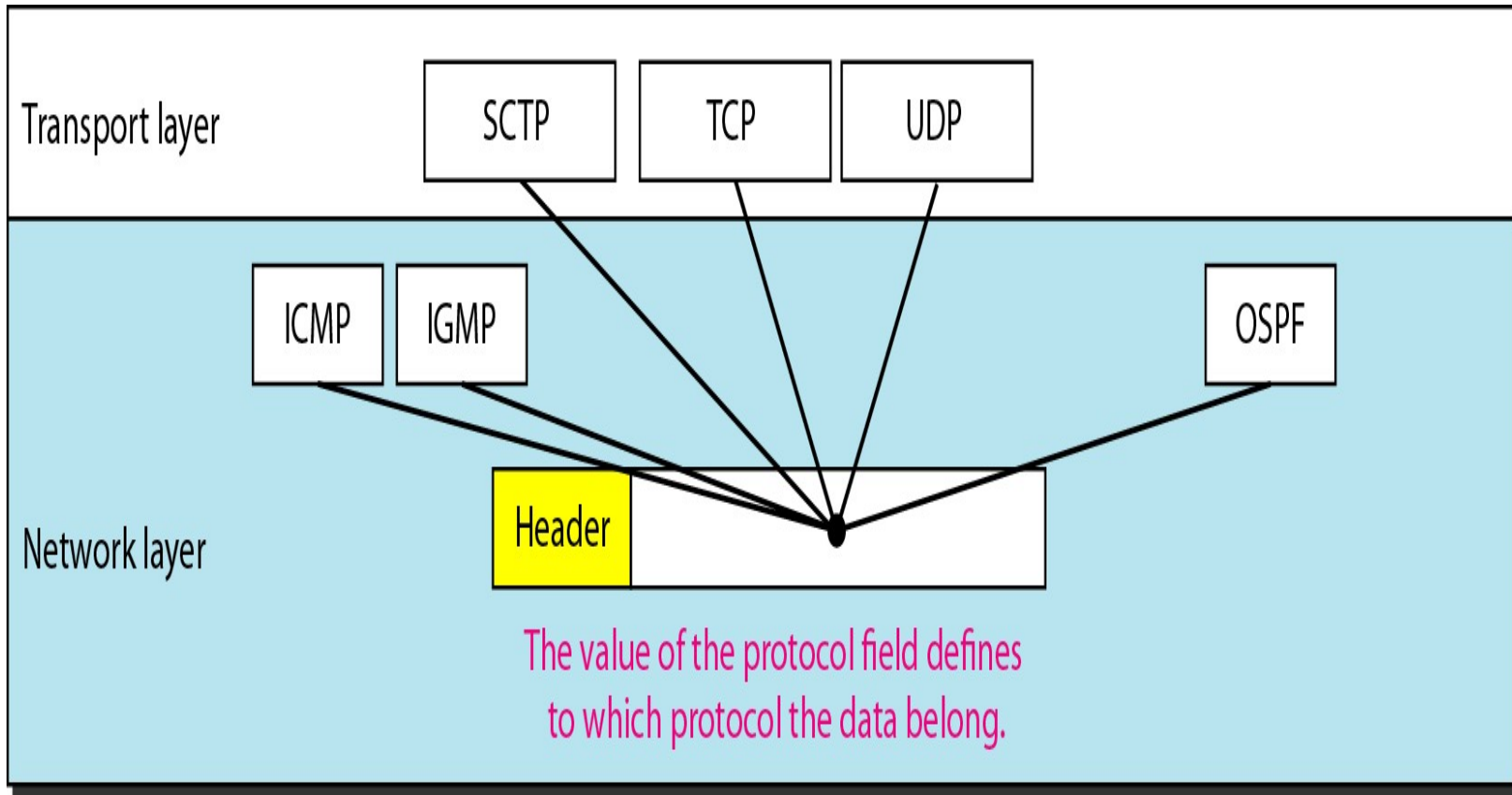
e value in protocol field is 17, the transport layer protocol used

_____

CP

DP

MP

MP

th of these is not applicable for IP protocol?

connectionless

fer reliable service

fer unreliable service

es not offer error reporting

th of the following field in IPv4 datagram is not related to fragm

ags

fset

OS

Thank You