IPv4 and IPv6 Packets

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Previous Session

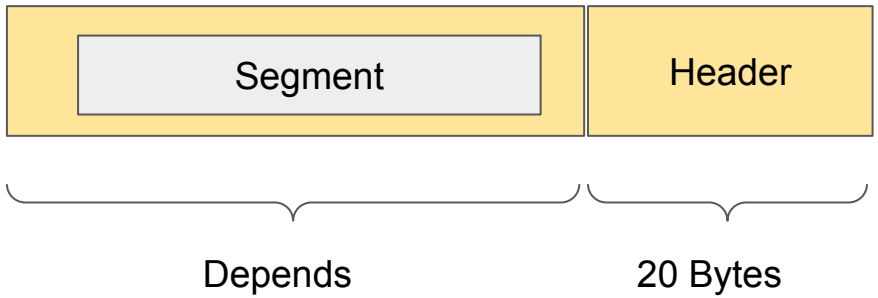
- Subnet Masking
  - Binary Version of IP address and the subnet mask.
  - Binary AND operation
  - Host Address ends with zero.
- CIDR
  - When you need more networks than the default.
  - Accordingly, Subnet mask should be chosen
  - Total networks, total hosts
  - First address and last address should not be used.
  - All zeros - network address and All ones - Broadcast address.

IPv4 Packets

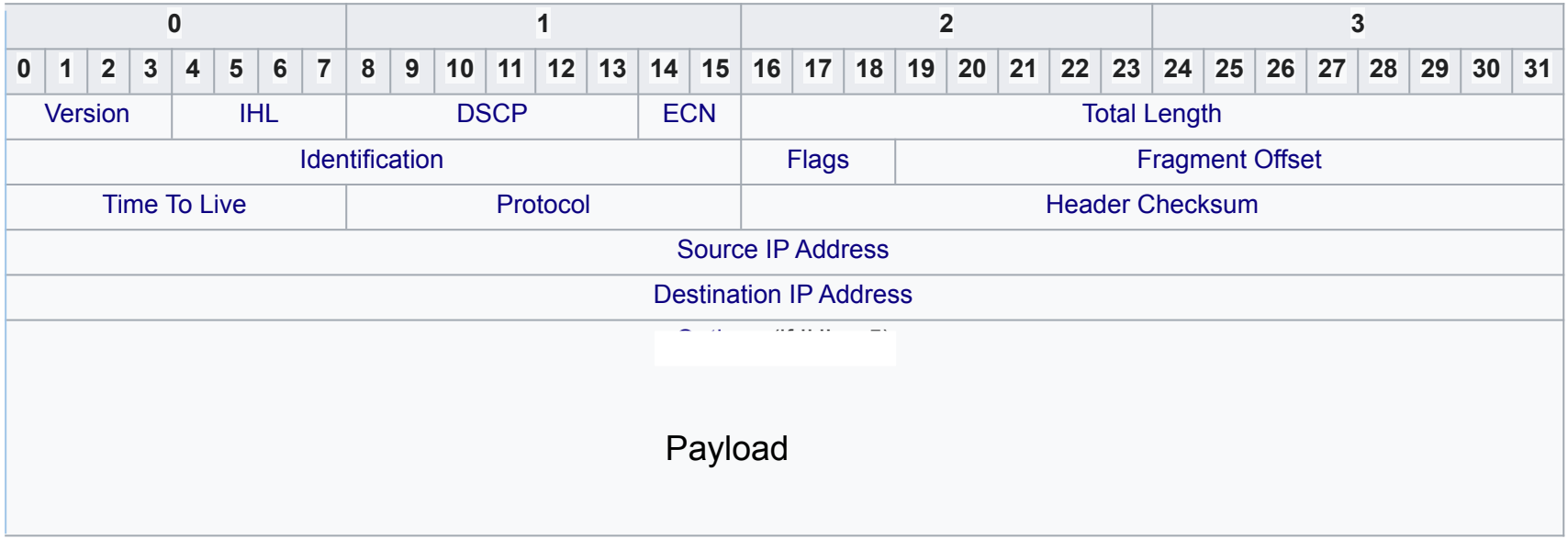
Header - 20 bytes

Payload - Depends. -Maximum 65,535 bytes.

Contains 32 bit words , how many words ? Depends.



IPv4 Packet Structure

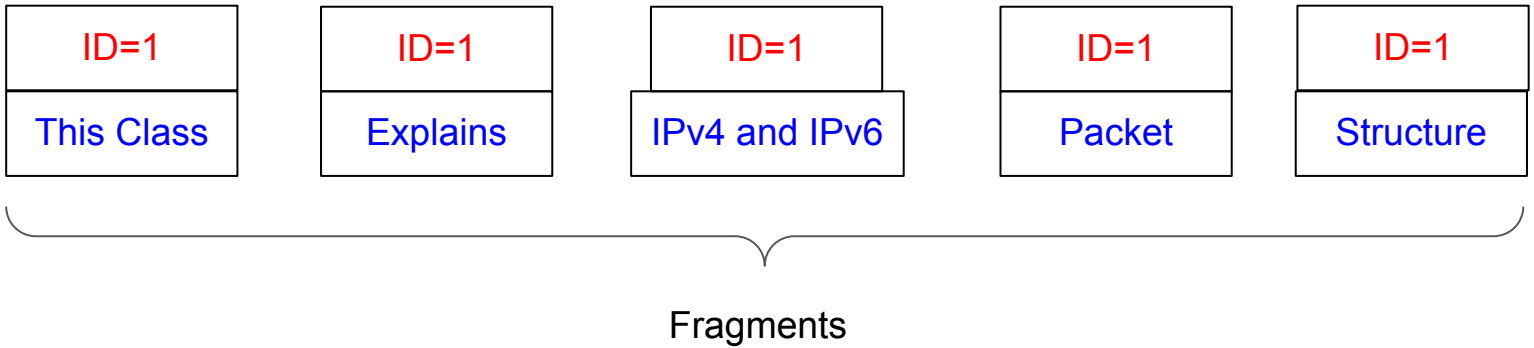


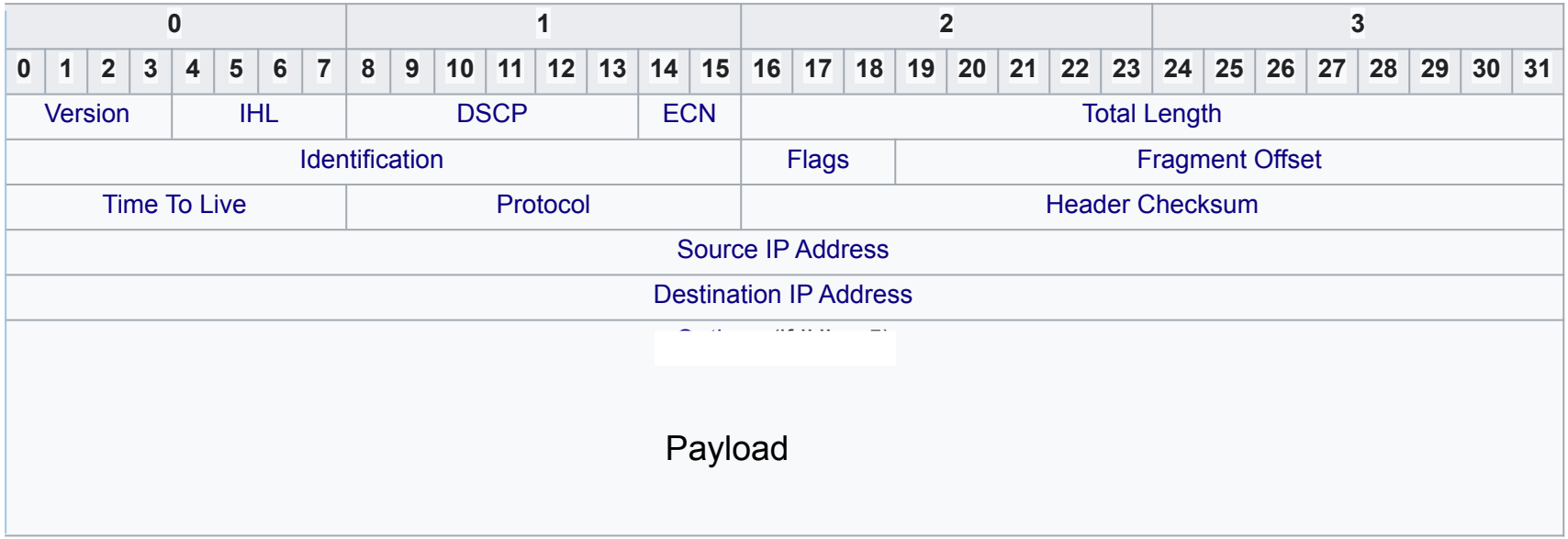
- IHL - Internet Header Length
- Differentiated Service Code Point (TOS)
  - DiffServ (VoIP)
- Explicit Congestion Control

Identification Field

Used for identifying the group of fragments of a single message.

Segment: This Class Explain IPv4 and IPv6 Packet Structure - Too big to fit in the packet



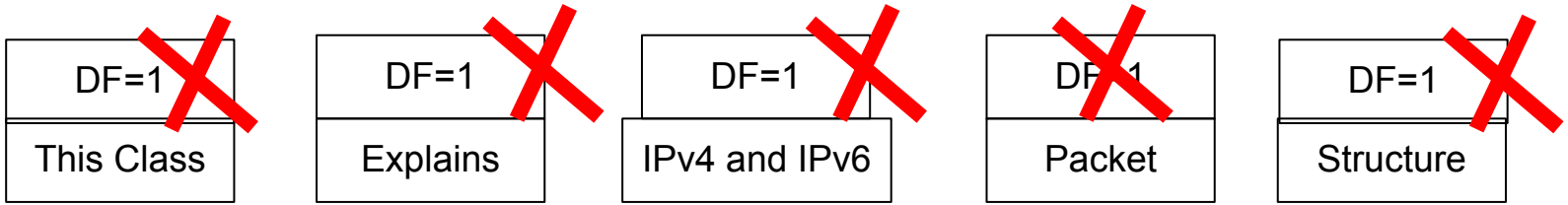


Flags (LSB - MSB)

- Bit 0 - Reserved (should be zero)
- Bit 1 - Don’t Fragment (DF)
- Bit 2 - More Fragment (MF)

Dont Fragment - Bit 1 = 1

Segment: This Class Explain IPv4 and IPv6 Packet Structure



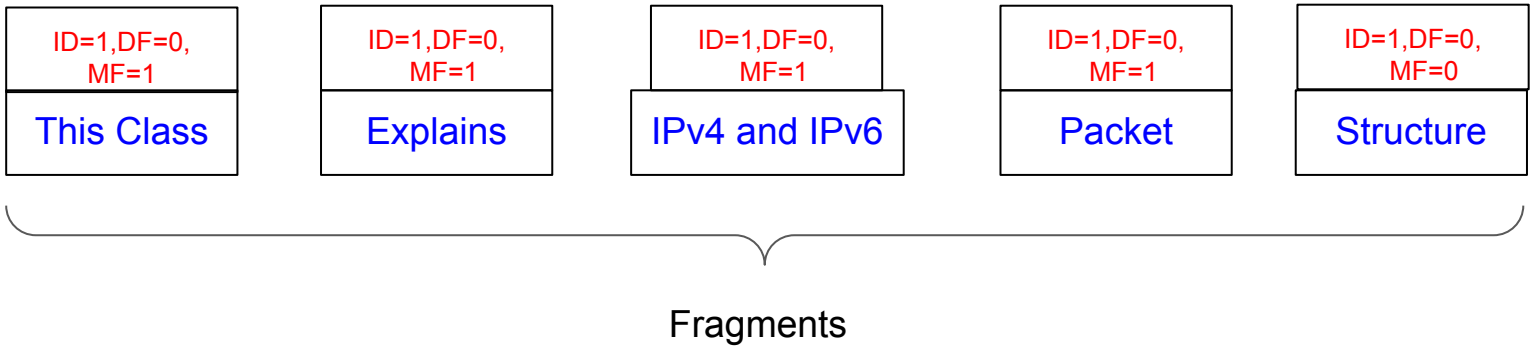
Packet size exceeds, packet will be dropped.

MF Bit = 0

Identification Field

Used for identifying the group of fragments of a single message.

Segment: This Class Explain IPv4 and IPv6 Packet Structure - Too big to fit in the packet



Original IP Datagram

Identifier	Total Length	DF May / Don't	MF Last / More	Fragment Offset
345	5140	0	0	0

1500- 20 (header) = 1480

1480 % 8 = 185

IP Fragments (Ethernet)

Identifier	Total Length	DF May / Don't	MF Last / More	Fragment Offset
345	1500	0	1	0
345	1500	0	1	185
345	1500	0	1	370
345	700	0	0	

1500- 20 (header) = 1480

1480 % 8 = 185

185 + 185 = 370

Image Source: http://dtdccie.blogspot.com/2015/10/mss-fragmentation-pmtud.html

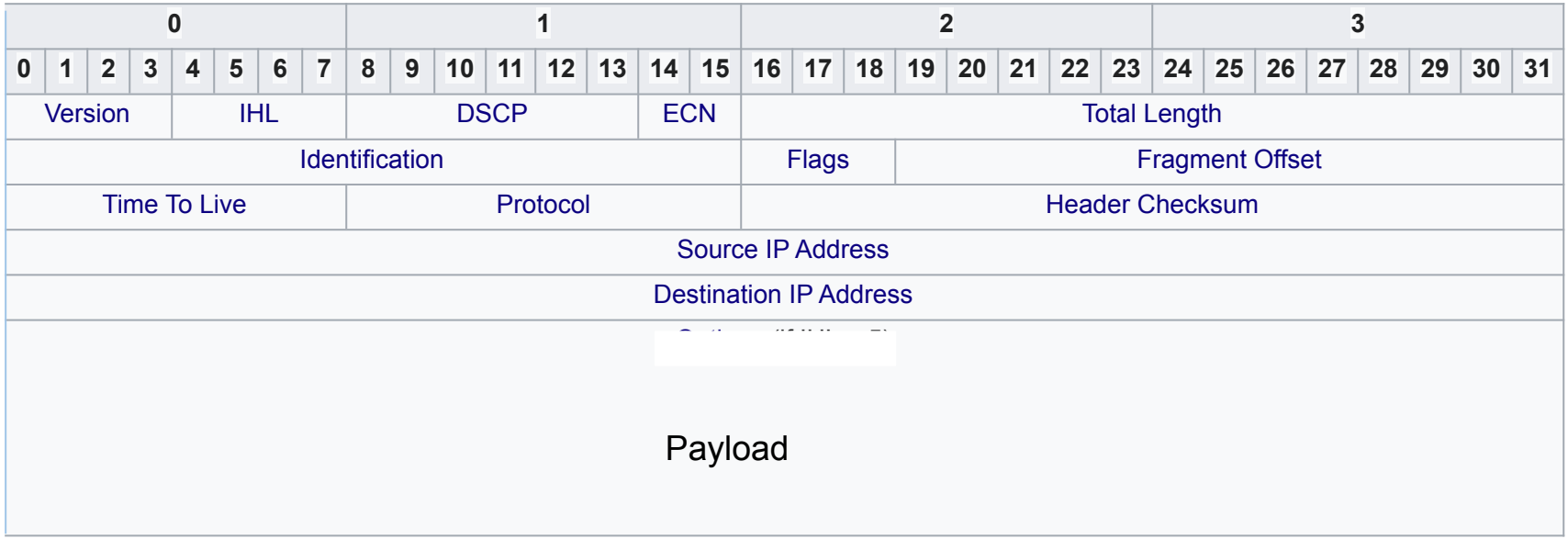
Fragment	Total bytes	Header bytes	Data bytes	"More fragments" flag	Fragment offset (8-byte blocks)
1	1500	20	1480	1	0
2	1020	20	1000	1	185
3	1500	20	1480	1	310
4	560	20	540	0	495

0.

0 + 1480/8 = 185

185 + 1000/8 = 310

310 + 1480/8 = 495



- 5 - 32 bit words in header
- 5 * 32 = 160 = 20 bytes.