

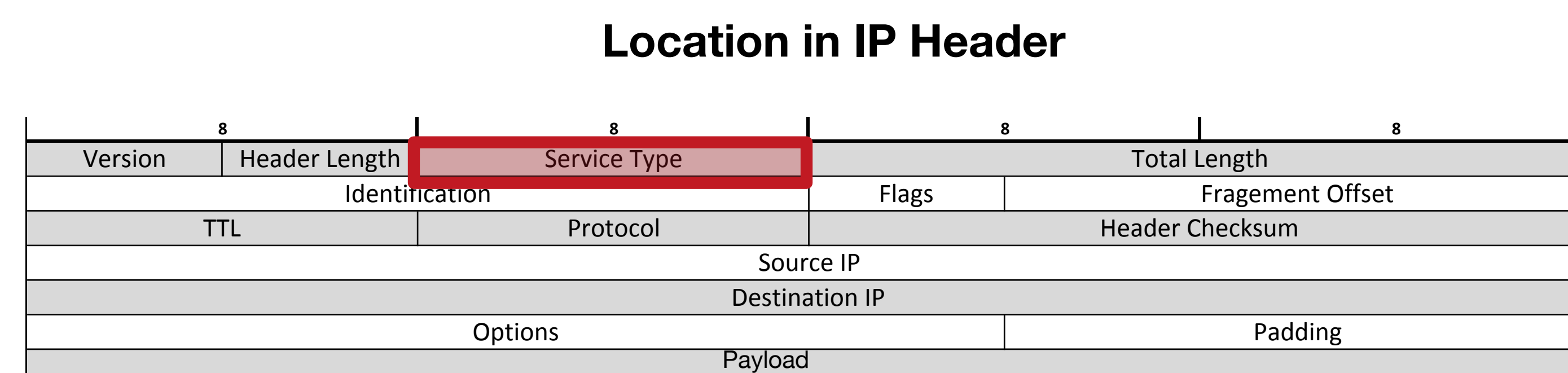
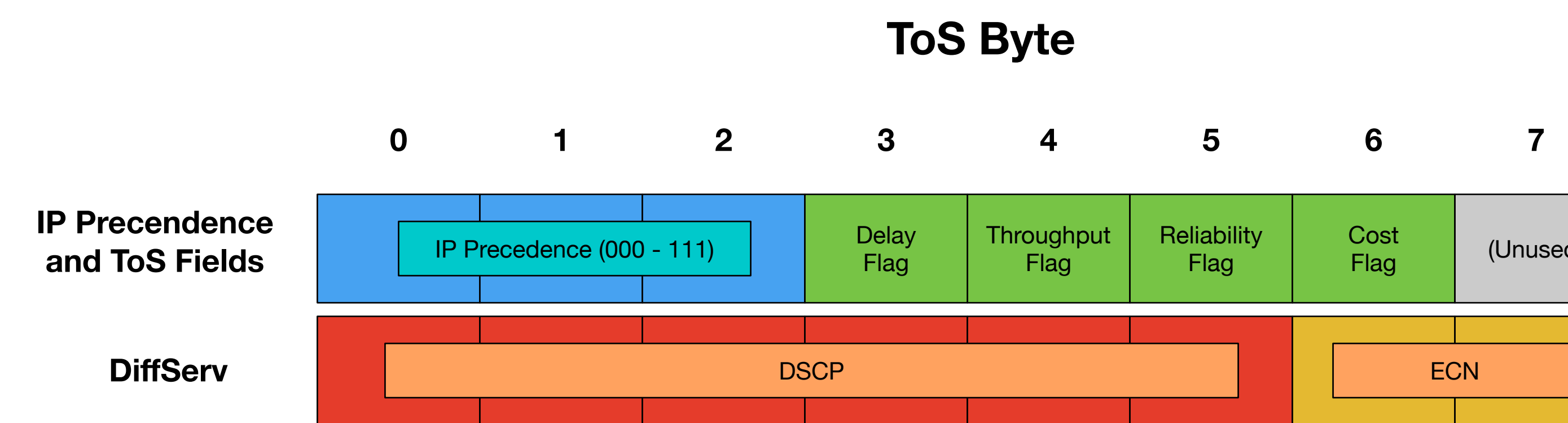
Type of Service Byte - IP Precedence and DSCP



IP Precedence

Precedence	Binary	Name
0	000	Routine
1	001	Priority
2	010	Immediate
3	011	Flash
4	100	Flash Override
5	101	Critical/ECP
6	110	Internetwork Control
7	111	Network Control

The IP ToS byte was a field in an IP header that was defined in RFC 791. It is used to modify packets for QoS treatment. The first three bits of the ToS field are called IP Precedence with the principle being that the higher the value the more important the traffic.



DiffServ and DSCP

DiffServ redefined the ToS Byte to include two main fields, the Differential Services field and ECN (Explicit Congestion Notification) field.

Expedite Forwarding (EF)

The expedited forwarding PHB uses a DSCP name of EF, whose binary value is 101110, with a decimal value of 46.

Queuing should be used to reduce delay, jitter and loss.
Policing should be used to prevent EF traffic from preventing other types of traffic getting enough bandwidth.

Best Effort (BE)

Best Effort, as the name implies, means no DSCP values are set and traffic is forwarded with no QoS treatment. BE has all bits of the ToS byte set to 0.

DiffServ Class Selectors (CS)

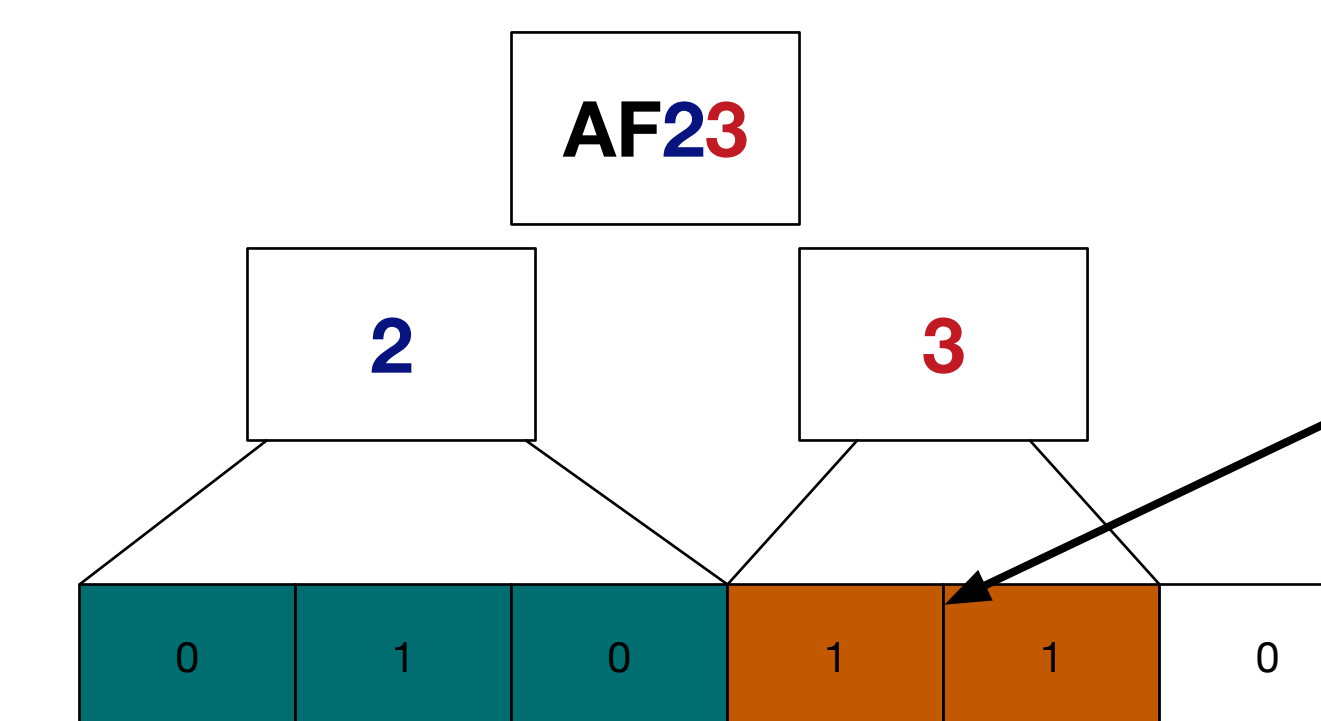
DiffServ calls DSCP values used for backward-compatibility with IP Precedence **Class Selectors**.

Name of DSCP Class Selector	Binary DSCP Value	Equivalent IP Precedence	Range of other compatible DSCP Values (in decimal)
Default	000000	0	0-7
CS1	001000	1	8-15
CS2	010000	2	16-23
CS3	011000	3	24-31
CS4	100000	4	32-39
CS5	101000	5	40-47
CS6	110000	6	48-55
CS7	111000	7	56-63

Assured Forwarding (AF) DSCP Values

	Low Drop Probability	Medium Drop Probability	High Drop Probability
Class 1	AF11	AF12	AF13
Class 2	AF21	AF22	AF23
Class 3	AF31	AF32	AF33
Class 4	AF41	AF42	AF43

Converting AF value to Decimal Equivalent



$$\begin{array}{r}
 0 \times 2^5 \\
 + 1 \times 2^4 \\
 + 0 \times 2^3 \\
 + 1 \times 2^2 \\
 + 1 \times 2^1 \\
 + 0 \times 2^0 \\
 \hline
 16 \\
 + 4 \\
 + 2 \\
 \hline
 22
 \end{array}$$

The second digit is converted to binary in the 2nd and 3rd least significant bits.

This bit is kept as zero. In this way, the decimal equivalent for a DSCP value will always be an even number

When converting to decimal, read all 6 bits and perform binary conversion as normal

Alternatively the following shortcut formula can be used for AFxy:

$$\text{Decimal equivalent} = 8x + 2y$$