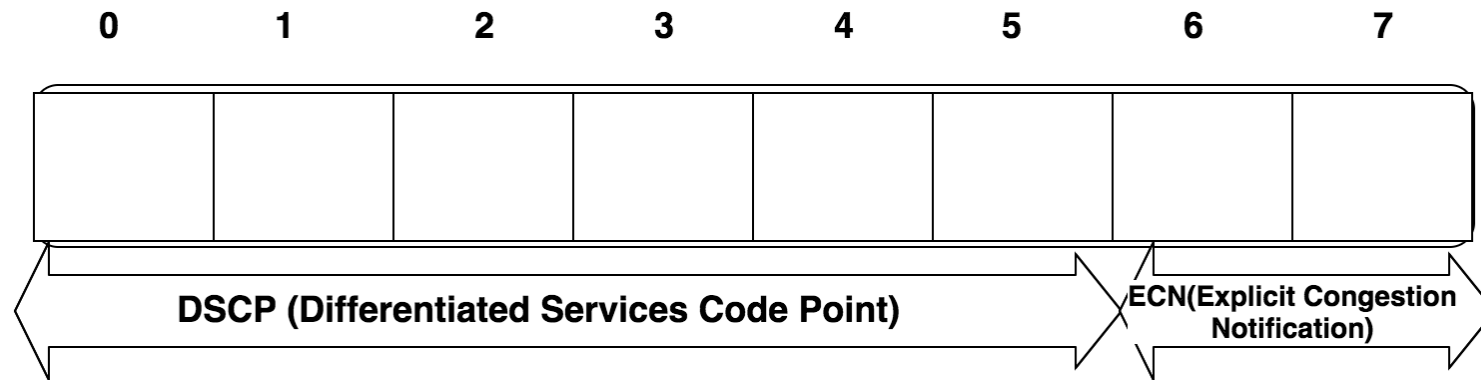


DSCP: Use Cases vs Specification

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DSCP



RFC2474: 1998

Implementors should note that the DSCP field is six bits wide. DS-compliant nodes MUST select PHBs by matching against the entire 6-bit DSCP field, e.g., by treating the value of the field as a table index which is used to select a particular packet handling mechanism which has been implemented in that device. The value of the CU field MUST be ignored by PHB selection. The DSCP field is defined as an unstructured field to facilitate the definition of future per-hop behaviors.

RFC2597: 1999

6. Recommended Codepoints

Recommended codepoints for the four general use AF classes are given below. These codepoints do not overlap with any other general use PHB groups.

The RECOMMENDED values of the AF codepoints are as follows: AF11 = '001010', AF12 = '001100', AF13 = '001110', AF21 = '010010', AF22 = '010100', AF23 = '010110', AF31 = '011010', AF32 = '011100', AF33 = '011110', AF41 = '100010', AF42 = '100100', and AF43 = '100110'. The table below summarizes the recommended AF codepoint values.

	Class 1	Class 2	Class 3	Class 4
	+-----+	+-----+	+-----+	+-----+
Low Drop Prec	001010	010010	011010	100010
Medium Drop Prec	001100	010100	011100	100100
High Drop Prec	001110	010110	011110	100110
	+-----+	+-----+	+-----+	+-----+

RFC3246: 2002

1. Introduction

Network nodes that implement the differentiated services enhancements to IP use a codepoint in the IP header to select a per-hop behavior (PHB) as the specific forwarding treatment for that packet [[3](#), [4](#)]. This memo describes a particular PHB called expedited forwarding (EF).

The intent of the EF PHB is to provide a building block for low loss, low delay, and low jitter services. The details of exactly how to build such services are outside the scope of this specification.

RFC5865: 2010

1. Introduction

This document requests one Differentiated Services Code Point (DSCP) from the Internet Assigned Numbers Authority (IANA) for a class of real-time traffic. This class conforms to the Expedited Forwarding (EF) [[RFC3246](#)] [[RFC3247](#)] Per-Hop Behavior. It is also admitted using a CAC procedure involving authentication, authorization, and capacity admission. This differs from a real-time traffic class that conforms to the Expedited Forwarding Per-Hop Behavior but is not subject to capacity admission or subject to very coarse capacity admission.

In addition, this document recommends that certain classes of video described in [[RFC4594](#)] be treated as requiring capacity admission.

RFC8622: 2019

6. Recommended DSCP

The RECOMMENDED codepoint for the LE PHB is '000001'.

Earlier specifications (e.g., [[RFC4594](#)]) recommended the use of Class Selector 1 (CS1) as the codepoint (as mentioned in [[RFC3662](#)]). This is problematic, since it may cause a priority inversion in Diffserv domains that treat CS1 as originally proposed in [[RFC2474](#)], resulting in forwarding LE packets with higher precedence than BE packets. Existing implementations SHOULD transition to use the unambiguous LE codepoint '000001' whenever possible.

This particular codepoint was chosen due to measurements on the currently observable Differentiated Services Code Point (DSCP) re-marking behavior in the Internet [[IETF99-Secchi](#)]. Since some network domains set the former IP Precedence bits to zero, it is possible that some other standardized DSCPs get mapped to the LE PHB DSCP if it were taken from the DSCP Standards Action Pool 1 (xxxxx0) [[RFC2474](#)] [[RFC8436](#)].

Name 	Value (Binary) 	Value (Decimal) 	Reference 
CS0	000000	0	[RFC2474]
CS1	001000	8	[RFC2474]
CS2	010000	16	[RFC2474]
CS3	011000	24	[RFC2474]
CS4	100000	32	[RFC2474]
CS5	101000	40	[RFC2474]
CS6	110000	48	[RFC2474]
CS7	111000	56	[RFC2474]
AF11	001010	10	[RFC2597]
AF12	001100	12	[RFC2597]
AF13	001110	14	[RFC2597]
AF21	010010	18	[RFC2597]
AF22	010100	20	[RFC2597]
AF23	010110	22	[RFC2597]
AF31	011010	26	[RFC2597]
AF32	011100	28	[RFC2597]
AF33	011110	30	[RFC2597]
AF41	100010	34	[RFC2597]
AF42	100100	36	[RFC2597]
AF43	100110	38	[RFC2597]
EF	101110	46	[RFC3246]
VOICE-ADMIT	101100	44	[RFC5865]

DSCP Pool 3 Codepoints

Registration Procedure(s)

Standards Action

Reference

[\[RFC2474\]](#)[\[RFC3260, Section 4\]](#)[\[RFC8436\]](#)

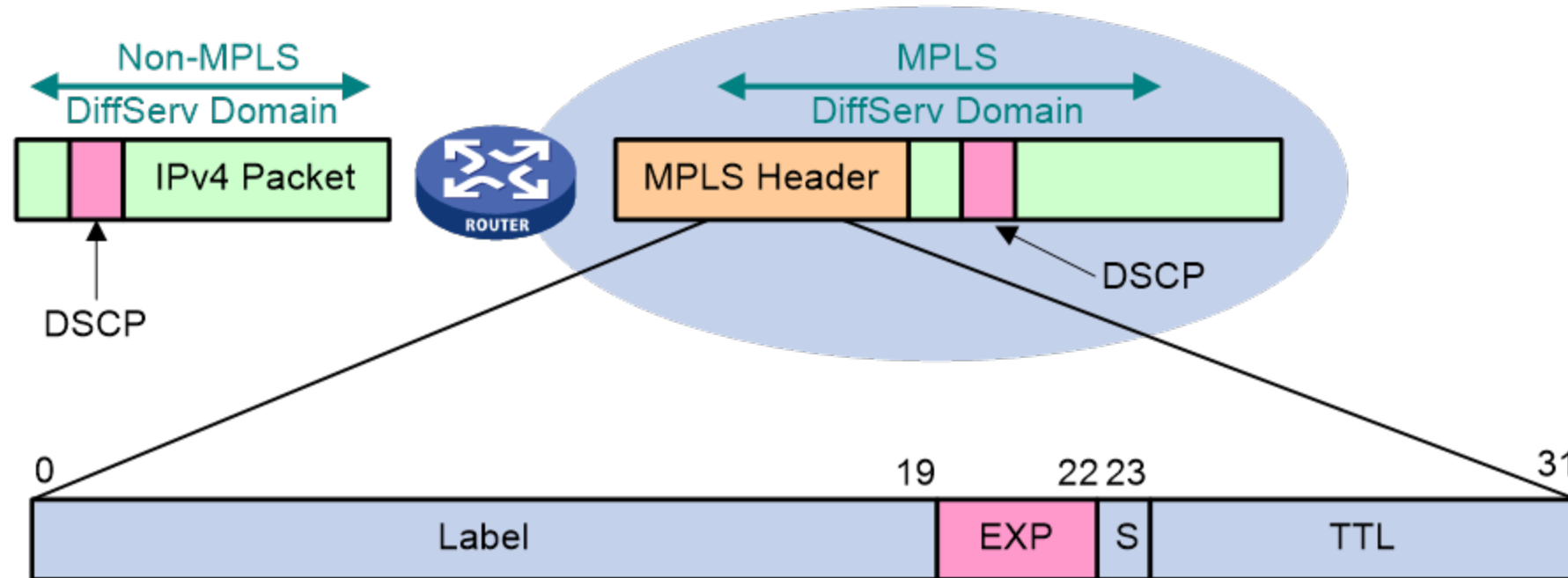
Available Formats



CSV

Name 	Value (Binary) 	Value (Decimal) 	Reference 
LE	000001	1	[RFC8622]

1st Elephant in The Room



2nd Elephant in The Room

class type queuing

Use this command to add a queuing class-map to a queuing policy map.

Use the `no` command to remove a queuing class-map from the policy map.

Command Syntax

```
class (type queuing ((default (q0|q1|q2|q3|q4|q5|q6|q7))|NAME) | NAME | queuing class-default)
no class (type queuing|) NAME
```

Parameters

NAME

Specify the class map name

<q0-q7>

Default queue name

DSCP Policy: Example

- CS1 bulk traffic;
- CS3 inter DC;
- CS4 inner DC + ECN;
- CS5 Internet traffic;
- CS*+1 – marking SYN retransmits;

Borders remark ingress traffic to CS5;

Borders remark egress traffic to CS0;

Server-side marking (eBPF);

ACCORDING TO THE MODEL,
THEY SHOULD BE ASLEEP BY NOW



IN THEORY,
PRACTICE IS THE SAME AS THEORY,
BUT NOT IN PRACTICE

RFC Strikes Back

```
1286 // port is in ``TIME_WAIT`` state.
1287 outgoing_port,
1288 num_outgoing_ports,
1289
1290 // ``peer_tos`` determines the TOS byte set in the IP header of every
1291 // packet sent to peers (including web seeds). ``0x0`` means no marking,
1292 // ``0x20`` represents the *QBone scavenger service*. For more
1293 // details, see QBSS_.
1294 //
1295 // .. _`QBSS`: http://qbone.internet2.edu/qbss/
1296 peer_tos,
1297
1298 // for auto managed torrents, these are the limits they are subject
1299 // to. If there are too many torrents some of the auto managed ones
1300 // will be paused until some slots free up. ``active_downloads`` and
1301 // ``active_seeds`` controls how many active seeding and downloading
```

```
1293 // port is in ``TIME_WAIT`` state.
1294 outgoing_port,
1295 num_outgoing_ports,
1296
1297 // ``peer_tos`` determines the TOS byte set in the IP header of every
1298 // packet sent to peers (including web seeds). ``0x0`` means no marking,
1299 // ``0x04`` represents Lower Effort. For more details see `RFC 8622`_.
1300 //
1301 // .. _`RFC 8622`: http://www.faqs.org/rfcs/rfc8622.html
1302 peer_tos,
1303
1304 // for auto managed torrents, these are the limits they are subject
1305 // to. If there are too many torrents some of the auto managed ones
1306 // will be paused until some slots free up. ``active_downloads`` and
1307 // ``active_seeds`` controls how many active seeding and downloading
```

DSCP Policy: Example

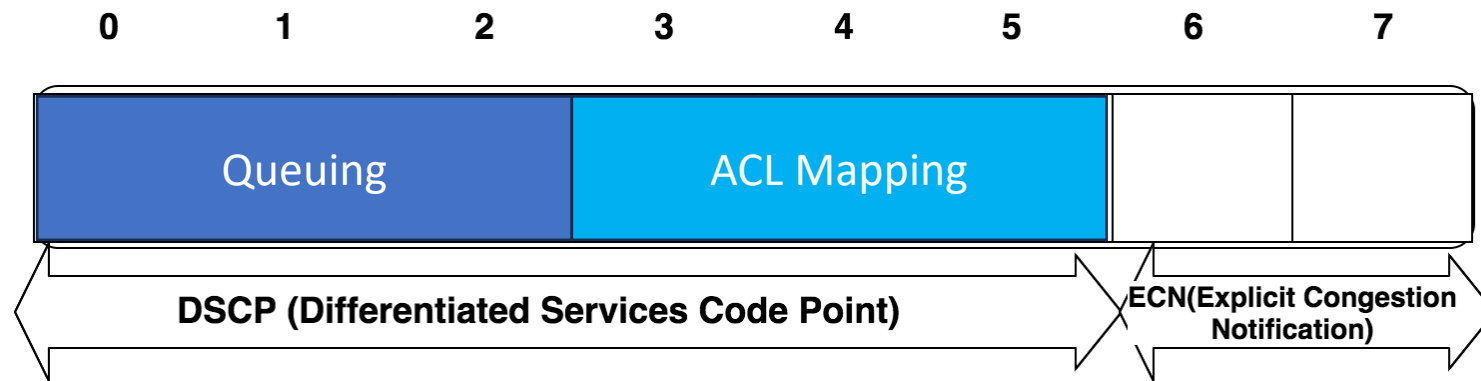
- CS1 bulk traffic;
- CS3 inter DC;
- CS4 inner DC + ECN;
- CS5 Internet traffic;
- CS*+1 – marking SYN retransmits;

Borders remark ingress traffic to CS5;

Borders remark egress traffic to CS0;

Server-side marking and **enforcement** (eBPF);

DSCP Field: Proposal



- SHOULD DSCP be limited to administrative domain?
- SHOULD not software set DSCP/QoS values?
- Absolute current RFCs ?