

# MPLS First Nibble

draft-ietf-mpls-1stnibble

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# Why Do We Need This?

- MPLS First Nibble (MFN) is the first four bits immediately following the Label Stack Element (LSE) with the S flag set to 1
- When the payload of an MPLS-encoded packet is IP, the IP version number happens to fall in the field reserved for MFN for other applications
- IP Version Numbers are tracked in the IANA “IP Version Numbers” registry
- MFN in Post-Stack Header (PSH) doesn’t have an IANA registry. This draft proposes the creation of such registry
- Can the MFN value unambiguously define the type of the payload of the MPLS packet? In other words, is there a 1:1 mapping between the MFN value and payload type?

# What We Know About MFN?

MFN Value	Interpretation	Reference
0x0	PW Control Word DetNet CW Word NSH Base Header, Payload	RFC 4385 RFC 8964 RFC 8300
0x1	PW Associated Channel/Generic Associated Channel DetNet Associated Channel	RFC 4385/RFC 5586  draft-ietf-detnet-mpls- oam
0x2	NSH Base Header, OAM	RFC 8300
0x3	Unallocated	Standards Action
0x4	Reserved	RFC 791, RFC 2780
0x5	BIER	RFC 8296
0x6	Reserved	RFC 8200
0x7 – 0xE	Unallocated	Standards Action
0xF	Reserved for expansion	draft-ietf-mpls-1stnibble

# Use of the MFN

- Load-balancing techniques
  - Several possible techniques, but not in scope for the draft
  - Identify packets with non-IP payload, to avoid load-balancing (RFC 4928)
  - E.g. Entropy Label (RFC 6790) or FAT PW Label (RFC 6391)
- Heuristic for load-balancing:
  - If MFN value is 0100b or 0110b – there is a high probability that the payload is IPv4 or IPv6. If there are other indications in the label stack supporting this, load sharing based on payload information may be used.
  - If MFN value is anything else, then the payload is non-IP packet. Load-balancing based on payload information should not be used. Other load-balancing techniques may be used.

# How to Use MFN Safely?

It is not possible to reliably determine what follows the LSE with the Bottom of Stack bit set through inspection of the first nibble following that LSE only.

Safety rule:

Correct interpretation of the MFN in PSH can be done only in the context of the LSE or a group of LSEs in the preceding label stack that characterize the type of the PSH, and that any attempt to rely on the value in any other context is unreliable.

# Next Steps

- Terminology of a multi-PSH case
- Welcome comments, questions
- WG LC

Thank you!