

Post-stack First Nibble

draft-ietf-mpls-1stnibble

Kireeti Kompella
Stewart Bryant
Matthew Bocci

Greg Mirsky
Loa Andersson
Jie Dong

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What Was Changed?

- Terminology
- Extract updates of RFC 4928
- Restructure IANA Post-stack First Nibble registry
- Security Considerations

Terminology

- Post-stack First Nibble (PFN) – previously referred to as MFN
- Post-Stack Header (PSH) – an optional field
- Deprecation: regardless of how the deprecation is understood in other IETF documents, the interpretation in this document is that if a practice has been deprecated, that practice should not be included in the new implementations or deployed in deployments
 - Open for discussion:
 - Use normative language?
 - ‘should’ or ‘must’ (whether as normative or not)?

Updates of RFC 4928

Paragraph 3 in Section 3 of RFC 4928 states that:

It is REQUIRED, however, that applications depend upon in-order packet delivery restrict the first nibble values to 0x0 and 0x1.

This will ensure that their traffic flows will not be affected if some future routing equipment does similar snooping on some future version(s) of IP.

RFC 4928 is to be updated as follows:

Network equipment that complies with [I-D.ietf-mpls-1stnibble] MUST use a PSH (Post-Stack Header) with a PFN (Post-stack First Nibble) value that is neither 0x4 nor 0x6 in all cases when the MPLS payload is not an IP packet.

Updates of RFC 4928 (cont.)

The recommendation proposes to update the paragraph 4 in Section 3 of RFC 4928:

This behavior implies that if in the future an IP version is defined with a version number of 0x0 or 0x1, then equipment complying with this BCP would be unable to look past one or more MPLS headers, and load-split traffic from a single LSP across multiple paths based on a hash of specific fields in the IPv0 or IPv1 headers. That is, IP traffic employing these version numbers would be safe from disturbances caused by inappropriate load-splitting but would also not be able to get the performance benefits.

RFC 4928 is to be updated as follows:

[I-D.ietf-mpls-1stnibble] deprecated the practice of deducing the payload type to avoid inaccurate load balancing based on the PFN value. This means that older implementations and deployments can continue to use that heuristic, while it must not be part of new implementations or deployments. The deprecation also means that concerns about load balancing for future IP versions with a version number of 0x0 or 0x1 are now moot.

A new document is to be published to obsolete MPLS encapsulations without PSH of non-IP payload when sufficient evidence exists that there are no marketed or deployed implementations using the heuristic practice.

Also, will add in Terminology:

PSH: Post-Stack Header

PFN: Post-stack First Nibble

PFN IANA Registry

Code points allocated for BIER		
Value	PSH Type	Reference
0x5	BIER header - Normal traffic	RFC 8296

Code points allocated for DETNET		
Value	PSH Type	Reference
0x0	DetNet Control Word	RFC 8964
0x1	DetNet Associated Channel	draft-ietf-detnet-mpls-oam

Code points allocated for Network Service Header (NSH)		
Value	PSH Type	Reference
0x0	NSH Base Header, Payload	RFC 8300
0x2	NSH Base Header, OAM	RFC 8300

Code points allocated for Pseudowires (PW)		
Value	PSH Type	Reference
0x0	PW Control Word	RFC 4385
0x1	PW Associated Channel	RFC 4385

PFN IANA Registry (Cont.)

Code points allocated for the MPLS Generic Associated Channel		
Value	PSH Type	Reference
0x1	MPLS G-ACh	RFC 5586
Reserved Code Points, not to be allocated		
Value	Usage	Reference
0x4	IPv4 Protocol Number	RFC 791
0x6	IPv6 Protocol Number	RFC 8200
Unassigned Code Points		
Value	PSH Type	Reference
0x3	-	-
0x7-0xF	-	-

Security Considerations

Now the Security Consideration section states:

This document proposes a new IANA registry and does not raise any security concerns or issues in addition to ones common to networking and those specific to MPLS networks.

Next Steps

- Welcome comments, questions
- Publish this document -> WG LC
- Move towards obsolescence of non-PSH for non-IP payload in the MPLS networks – new document

Thank you!