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Special Purpose Label terminology
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Abstract

This document discusses and recommends a terminology that may be used when MPLS Special Purpose Labels (SPL) are specified and documented.

This document updates RFC 7274 and RFC 3032.

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1. Introduction

RFC 7274 [RFC7274] made some changes to the terminology used for MPLS Special Purpose Labels, but did not define consistent terminology.

One thing that RFC 7274 did was to deprecate use use of the term "reserved labels" when describing a range of labels allocated from a registry maintained by IANA. The term "Reserved" in such a registry means "set aside, not to be used", but that range of labels was available for allocation according to the policies set out in the registry. The name "Special Purpose Labels" was introduced in RFC 7274 in place of the previous term, and the abbreviation SPL was recommended.

At the time of writing the first version of this document, the IETF was in the process of allocating the very first SPLs from the Extended SPL range [RFC8595]. This document discusses and recommends terminology and abbreviations to be used when talking about and documenting Special Purpose Labels.

This document updates RFC 3032 [RFC3032] and RFC 7274 [RFC7274] and RFC 3032 [RFC3032] in that it changes the terminology for both Base

SPLs and Extended SPLs.

2. Background

Two sets of SPLs are defined for use in MPLS:

The range of SPLs 0-15 is specified in RFC 3032 [RFC3032].

The range of SPLs 0-1048575 is specified in RFC 7274 [RFC7274].

* the values 0-15 has been reserved never to be allocated

* the values 15-239 are available for allocation

* the values 240-255 are for experimental use

* the values 256-1048575 are currently not available for allocation, and a standard tracks RFC will be needed to make the entire range or part of it available for allocation

2.1. GMPLS Special Purpose Labels

Note that IANA maintains a registry called "Special Purpose Generalized Label Values". Labels in that registry have special meaning when present in certain signalling objects, are 32 bits long, and are not to be confused with MPLS forwarding plane labels. This document does not make any changes to the registry or how labels from that registry are described.

3. Terminology and Abbreviations

IANA maintains a name space for 'Special-Purpose Multiprotocol Label Switching (MPLS) Label Values' code points [SPL-NAME-SPACE]. Within this name space there are two registries. One is called the 'Special-Purpose MPLS Label Values' registry [bSPL]. The other is called 'Extended Special-Purpose MPLS Label Values' registry [eSPL].

The difference in the name of the name space and the first registry is only that the MPLS abbreviation is expanded. This document changes the name of the first registry to 'Base Special-Purpose MPLS Label Values', but leaves the name of the latter registry unchanged as 'Extended Special-Purpose MPLS Label Values'.

The following conventions will be used in specifications and when talking about SPLs

- Collectively, the two ranges are known as Special Purpose Labels (SPL).

- The special purpose labels from the lower range will be called Base Special Purpose Labels (bSPL).

- The special purpose labels from the higher range will be called Extended Special Purpose Labels (eSPL).

- The combination of the Extension Label (XL) (value 15 which is an bSPL, but that is also called xSPL) and an eSPL is called a Composite Special Purpose Label (cSPL).

This results in a label stacks such as the illustrative examples shown in Figure 1 and Figure 2.

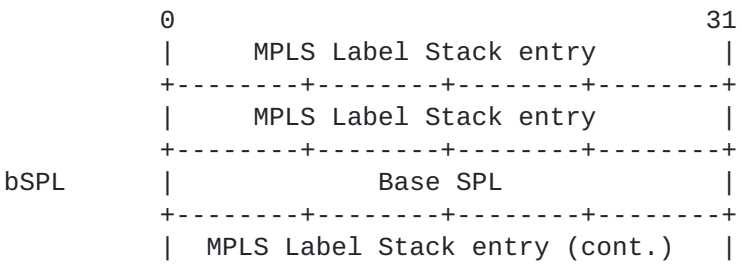

Figure 1: Example of Label Stack

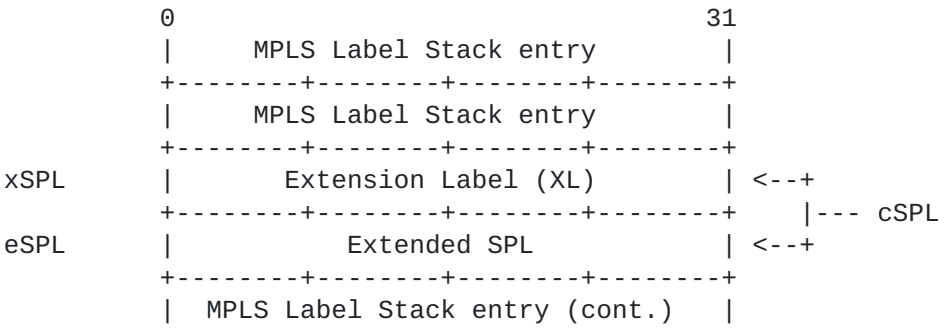

Figure 2: Example of Label Stack

4. Security Considerations

This document is entirely about terminology for SPLs and does not effect the forwarding in the MPLS data plane, nor does it have any effect on how LSPs are establsihed by an MPLS control plane or by a centralized controller. The doucment describes a terminology to be used when describing and specifying the use of SPLs.

This document does not aim to describe existing implementations of SPLs or the potential vulnerabilities of SPLs.

5. IANA Considerations

We request that the name of the IANA registry that today is called "Special-Purpose MPLS Label Values" is changed to "Base Special-Purpose MPLS Label Values".

6. Acknowledgements

The authors of this document would like to thank Stewart Bryant for careful review and constructive suggestions.

7. References

7.1. Normative References

[bSPL] "Special-Purpose MPLS Label Values", <https://www.iana.org/assignments/mpls-label-values/mpls-label-values.xhtml#special-purpose/>.

[eSPL] "Extended Special-Purpose MPLS Label Values", <https://www.iana.org/assignments/mpls-label-values/mpls-label-values.xhtml#extended/>.

[RFC3032] Rosen, E., Tappan, D., Fedorkow, G., Rekhter, Y., Farinacci, D., Li, T., and A. Conta, "MPLS Label Stack Encoding", RFC 3032, DOI 10.17487/RFC3032, January 2001, <https://www.rfc-editor.org/info/rfc3032>.

[RFC7274] Kompella, K., Andersson, L., and A. Farrel, "Allocating and Retiring Special-Purpose MPLS Labels", RFC 7274, DOI 10.17487/RFC7274, June 2014, <https://www.rfc-editor.org/info/rfc7274>.

[SPL-NAME-SPACE] "Special-Purpose Multiprotocol Label Switching (MPLS) Label Values", <https://www.iana.org/assignments/mpls-label-values/mpls-label-values.xhtml/>.

7.2. Informative References

[RFC8595] Farrel, A., Bryant, S., and J. Drake, "An MPLS-Based Forwarding Plane for Service Function Chaining", RFC 8595, DOI 10.17487/RFC8595, June 2019, <https://www.rfc-editor.org/info/rfc8595>.

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