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G. Martinelli
M. Kattan
G. Galimberti
Cisco
A. Zanardi
CREATE-NET

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Encoding for WSON Information Model with Impairments Validation.
draft-martinelli-ccamp-wson-iv-encode-00

Abstract

This document defines proper encoding for the Information Model to support Impairment-Aware (IA) Routing and Wavelength Assignment (RWA) function. This operation might be required in Wavelength Switched Optical Networks (WSON) that already support RWA, encoding defined here goes in addition to available WSON encoding and it is fully compatible with it.

As the information model, the encoding is independent from control plane architectures and protocol implementations. Its definitions must be reused in related protocol extensions.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on January 31, 2013.

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1. Introduction

In case of WSON where optical impairments plays a significant role, the framework document [RFC6566] defines related control plane architectural options for an Impairment Aware routing and wavelength assignment (IA-RWA). This document provides a suitable encoding for the related WSON Impairment Information Model defined [ID.martinelli-ccamp-wson-iv-info].

This document directly refers to ITU recommendations [ITU.G680] and [ITU.G697] as already detailed in the information model.

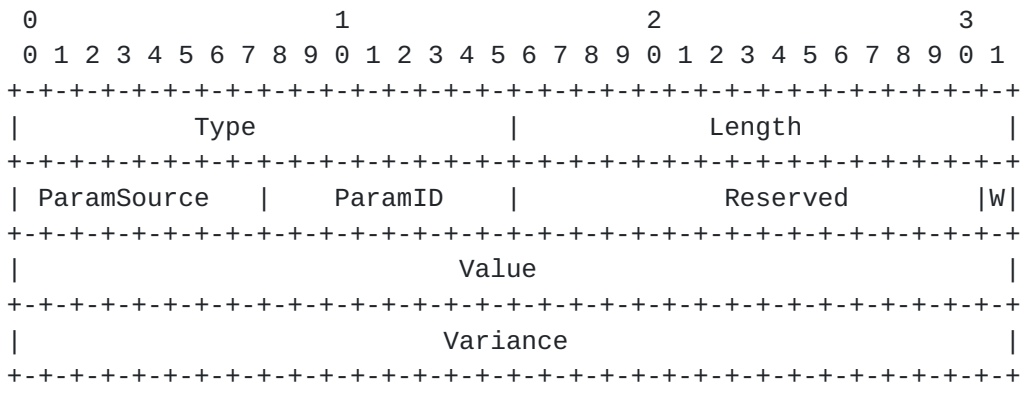
1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

2. Encoding

2.1. Optical Parameter

The OPTICAL_PARAM is defined as a TLV object.



Where the following parameters are defined:

Type. IANA defined for Optical Parameter TLV.

Length. The length (bytes) of this TLV including the header.

ParamSource. Where this parameter was defined. Currently only [ITU.G697] has defined this with value 1.

ParamID. Parameter identifier according to the source. [ITU.G697] has defined the following identifiers:

1. Reserved
2. Reserved
3. Reserved
4. Reserved
5. OSNR
6. Q Factor
7. PMD
8. Residual Chromatic Dispersion

Value. Value for the parameter. As defined by [ITU.G697] is a 32 bit IEEE floating point number.

Variance. Variance for the parameter, a 32 bit IEEE floating point number.

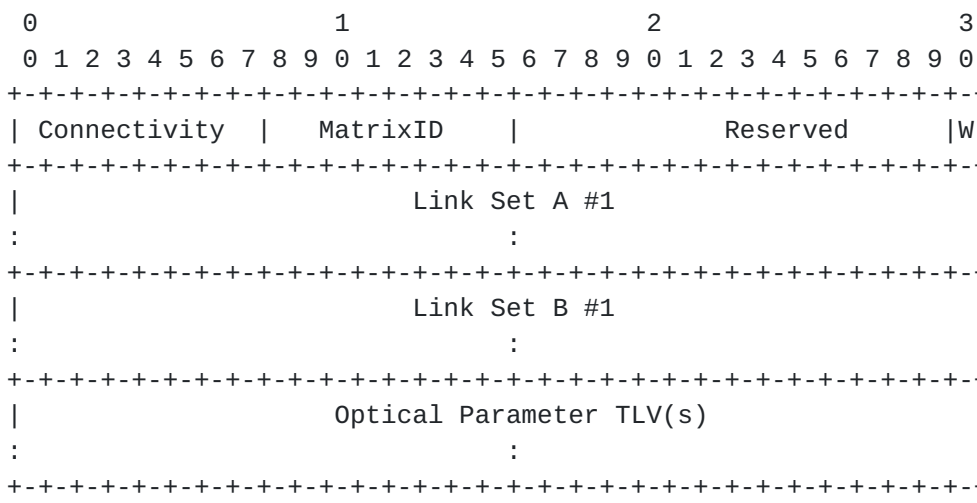
In addition the following flags is defined:

W. The parameter has a wavelength dependency

[EDITOR NOTE: encoding to be refined. In case of wavelength dependency the label set can be added within parameter definition. To evaluate vs. with impairment matrix flags]

2.2. Impairment Matrix

As defined by the [ID.martinelli-ccamp-wson-iv-info] the Impairment Matrix follow the same structure as the Connectivity Matrix with some variations.



Where:

Connectivity: 2, Impairment Matrix.

MatrixID: matrix identifier, the scope of this integer number is shared with [I-D.ietf-ccamp-rwa-info].

N: Node scope flags. With this flag set there's no Link Set information but only a list of optical parameters TLVs that apply to the whole optical node.

W: Wavelength Dependency Matrix [EDITOR NOTE: to evaluate vs a flag at parameter level.]

3. Acknowledgements

TBD

4. IANA Considerations

This document reuse the ConnectivityMatrix object defined in [I-D.ietf-ccamp-general-constraint-encode].

This document defines the Optical Parameter Object.

5. Security Considerations

All drafts are required to have a security considerations section. See RFC 3552 [RFC3552] for a guide.

6. References

6.1. Normative References

[ITU.G680]
International Telecommunications Union, "Physical transfer functions of optical network elements", ITU-T Recommendation G.680, July 2007.

[ITU.G697]
International Telecommunications Union, "Optical monitoring for dense wavelength division multiplexing systems", ITU-T Recommendation G.697, February 2012.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

6.2. Informative References

[I-D.ietf-ccamp-general-constraint-encode]
Bernstein, G., Lee, Y., Li, D., and W. Imajuku, "General Network Element Constraint Encoding for GMPLS Controlled Networks", draft-ietf-ccamp-general-constraint-encode-08 (work in progress), July 2012.

[I-D.ietf-ccamp-rwa-info]
Lee, Y., Bernstein, G., Li, D., and W. Imajuku, "Routing and Wavelength Assignment Information Model for Wavelength Switched Optical Networks", draft-ietf-ccamp-rwa-info-14 (work in progress), March 2012.

[I-D.narten-iana-considerations-rfc2434bis]
Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", draft-narten-iana-considerations-rfc2434bis-09 (work in progress), March 2008.

[ID-martinelli-ccamp-wson-iv-info]
G. Martinelli, M. Kattan, G. Galimberti, A.Zanardi, "Information Model for Wavelength Switched Optical Networks (WSON) with Optical Impairments Validation", draft-martinelli-ccamp-wson-iv-info-00 (work in progress), 2012.

[RFC3552] Rescorla, E. and B. Korver, "Guidelines for Writing RFC Text on Security Considerations", BCP 72, RFC 3552, July 2003.

[RFC6163] Lee, Y., Bernstein, G., and W. Imajuku, "Framework for GMPLS and Path Computation Element (PCE) Control of Wavelength Switched Optical Networks (WSONs)", RFC 6163, April 2011.

[RFC6566] Lee, Y., Bernstein, G., Li, D., and G. Martinelli, "A Framework for the Control of Wavelength Switched Optical Networks (WSONs) with Impairments", RFC 6566, March 2012.

Authors' Addresses

Giovanni Martinelli
Cisco
via Philips 12
Monza, 20900
Italy

Phone: +39 039 2092044
Email: giomarti@cisco.com

Moustafa Kattan
Cisco
DUBAI, 500321
UNITED ARAB EMIRATES

Phone:
Email: mkattan@cisco.com

Gabriele M. Galimberti
Cisco
Via Philips,12
Monza 20900
Italy

Phone: +39 039 2091462
Email: ggalimbe@cisco.com

Andrea Zanardi
CREATE-NET
via alla Cascata 56 C, Povo
Trento 38100
Italy

Email: andrea.zanardi@create-net.org