

Internet Engineering Task Force
Internet-Draft
Intended status: Standards Track
Expires: December 14, 2013

D. Hiremagalur, Ed.
G. Grammel, Ed.
J. Drake, Ed.
Juniper
G. Galimberti, Ed.
Z. Ali, Ed.
Cisco
R. Kunze, Ed.
Deutsche Telekom
July 15, 2013

Extension to the Link Management Protocol (LMP/DWDM -rfc4209) for Dense Wavelength Division Multiplexing (DWDM) Optical Line Systems to manage application code of optical interface parameters in DWDM application
[draft-dharinigert-ccamp-g-698-2-lmp-03](#)

Abstract

This memo defines extensions to LMP([rfc4209](#)) for managing Optical parameters associated with Wavelength Division Multiplexing (WDM) systems or characterized by the Optical Transport Network (OTN) in accordance with the Interface Application Code approach defined in ITU-T Recommendation G.698.2.[[ITU.G698.2](#)], G.694.1.[[ITU.G694.1](#)] and its extensions./>

Copyright Notice

Copyright (c) 2011 IETF Trust and the persons identified as the document authors. All rights reserved.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on December 14, 2013.

Copyright Notice

Copyright (c) 2013 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

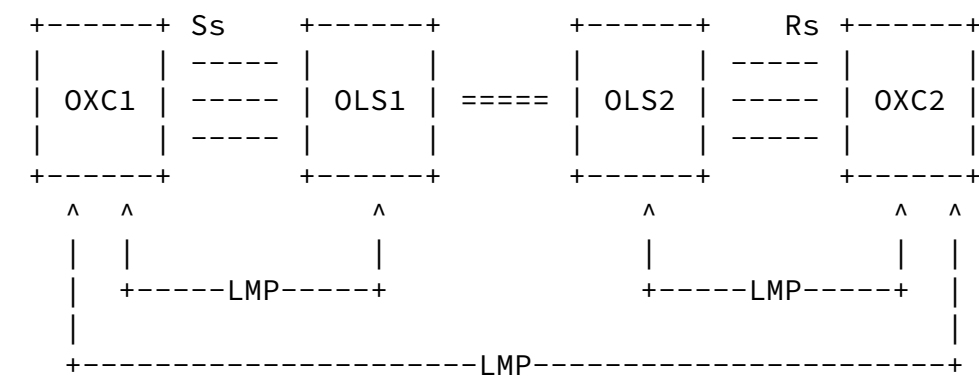
1.	Introduction	2
2.	Extensions to LMP-WDM Protocol	3
3.	Black Link General Parameters - BL_General	4
4.	Black Link ApplicationCode - BL_ApplicationCode	4
5.	Black Link - BL_Ss	5
6.	Black Link - BL_Rs	5
7.	Security Considerations	6
8.	IANA Considerations	6
9.	References	7
9.1.	Normative References	7
9.2.	Informative References	8
	Authors' Addresses	8

[1.](#) Introduction

This extension is based on "[draft-galikunze-ccamp-g-698-2-snmp-mib-03](#)" and "[draft-kunze-g-698-2-management-control-framework-02](#)", for the relevant interface optical parameters described in recommendations like ITU-T G.698.2 [[ITU.G698.2](#)]. The LMP Model from [RFC4902](#) is extended to provide link property correlation between a client and an OLS device. By using LMP, the capabilities of either end of this link are exchanged where the term 'link' refers to the attachment link between OXC and OLS (see Figure 1). By performing link property correlation, both ends of the link can agree on a common parameter window that can be supported and supervised by each device. The actual selection of a specific parameter value within

the parameter window is outside the scope of LMP. In GMPLS the parameter selection (e.g. wavelength) is performed by RSVP-TE and Wavelength routing by IGP.

Figure 1 Extended LMP Model (from [RFC4209])



- OXC : is an entity that contains transponders
- OLS : generic optical system, it can be -
Optical mux, Optical demux, Optical Add Drop Mux, etc
- OLS to OLS : represents the black-Link itself
- Rs/Ss : inbetween the OXC and the OLS

Figure 1: Extended LMP Model

2. Extensions to LMP-WDM Protocol

This document defines extensions to [RFC4209] to allow the Black Link (BL) parameters of G.698.2, as described in the draft [draft-kunze-g-698-2-management-control-framework-02](#), to be exchanged between a router or optical switch and the optical line system to which it is attached. In particular, this document defines additional Data Link sub-objects to be carried in the LinkSummary message defined in [RFC4204] and [RFC6205]. The OXC and OLS systems may be managed by different Network management systems and hence may not know the capability and status of their peer. The intent of this

These are the general parameters as described in [G698.2]. Please refer to the "[draft-galikusze-ccamp-g-698-2-snmp-mib-03](#)". for more details about these parameters.

The general parameters are

1. Single-channel application codes -- 32 bytes
(from [G698.1]/[G698.2]/[G959.1])

Figure 3: The format of the this sub-object (Type = TBA, Length = TBA) is as follows:

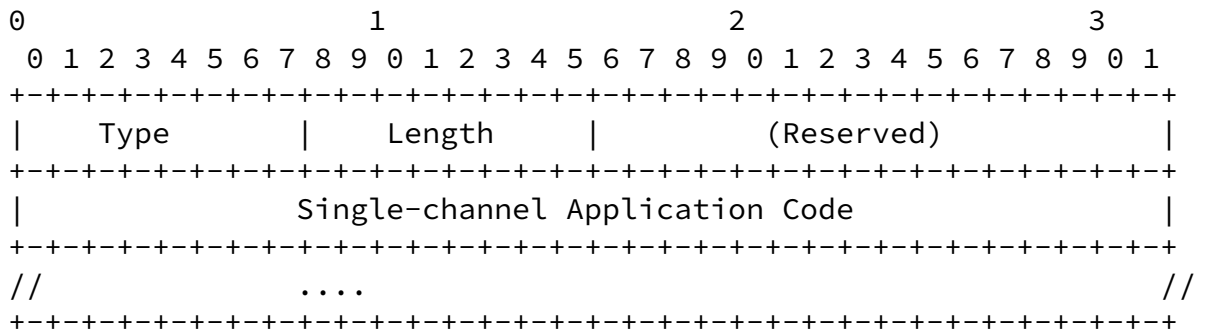


Figure 3: BL_ApplicationCode

5. Black Link - BL_Ss

These are the G.698.2 parameters at the Source(Ss reference points). Please refer to "[draft-galikusze-ccamp-g-698-2-snmp-mib-03](#)" for more details about these parameters.

1. Minimum Mean Channel Output Power -(0.1 dbm) 4 bytes

2. Maximum Mean Channel Output Power -(0.1 dbm) 4 bytes

Figure 4: The format of the Black link sub-object (Type = TBA, Length = TBA) is as follows:

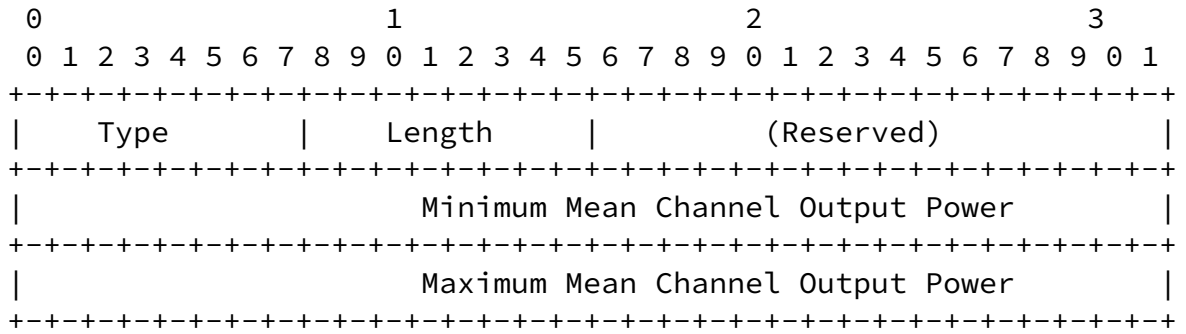


Figure 4: Black Link - BL_Ss

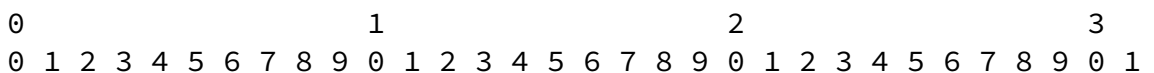
6. Black Link - BL_Rs

These are the G.698.2 parameters at the Sink (Rs reference points). Please refer to the "[draft-galikusze-ccamp-g-698-2-snmp-mib-02](#)" for more details about these parameters.

1. Minimum Mean Input Power - (0.1dbm) 4bytes
2. Maximum Mean Input Power - (0.1dbm) 4bytes
3. Minimum OSNR - (0.1dB) 4bytes
4. OSNR Tolerance - (0.1dB) 4bytes
5. Current Input Power - (0.1dbm) 4bytes

Figure 5: The format of the Black link sub-object (Type = TBA, Length = TBA) is as follows:

The format of the Black Link/OLS Sink sub-object (Type = TBA, Length = TBA) is as follows:



```

+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|   Type   |   Length   |                                     (Reserved) |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|                                     Minimum Mean Input Power |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|                                     Maximum Mean Input Power |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|                                     Minimum OSNR |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|                                     OSNR Tolerance |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
|                                     Current Input Power |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

Figure 5: Black Link - BL_Rs

7. Security Considerations

LMP message security uses IPsec, as described in [RFC4204]. This document only defines new LMP objects that are carried in existing LMP messages, similar to the LMP objects in [RFC:4209]. This document does not introduce new security considerations.

8. IANA Considerations

LMP <xref target="RFC4204"/> defines the following name spaces and the ways in which IANA can make assignments to these namespaces:

- LMP Message Type
- LMP Object Class
- LMP Object Class type (C-Type) unique within the Object Class
- LMP Sub-object Class type (Type) unique within the Object Class

This memo introduces the following new assignments:

LMP Sub-Object Class names:

- under DATA_LINK Class name (as defined in <xref target="RFC4204"/>)
- BL_General (sub-object Type = TBA)
 - BL_Applicationcode (sub-object Type = TBA)
 - BL_Ss (sub-object Type = TBA)

9. References

9.1. Normative References

- [RFC4204] Lang, J., "Link Management Protocol (LMP)", [RFC 4204](#), October 2005.
- [RFC4209] Fredette, A. and J. Lang, "Link Management Protocol (LMP) for Dense Wavelength Division Multiplexing (DWDM) Optical Line Systems", [RFC 4209](#), October 2005.
- [RFC6205] Otani, T. and D. Li, "Generalized Labels for Lambda-Switch-Capable (LSC) Label Switching Routers", [RFC 6205](#), March 2011.
- [RFC4054] Strand, J. and A. Chiu, "Impairments and Other Constraints on Optical Layer Routing", [RFC 4054](#), May 2005.
- [ITU.G698.2]
International Telecommunications Union, "Amplified multichannel dense wavelength division multiplexing applications with single channel optical interfaces ", ITU-T Recommendation G.698.2, November 2009.
- [ITU.G694.1]
International Telecommunications Union, "'Spectral grids for WDM applications: DWDM frequency grid" ", ITU-T Recommendation G.698.2, February 2012.
- [ITU.G709]
International Telecommunications Union, "Interface for the Optical Transport Network (OTN) ", ITU-T Recommendation G.709, March 2003.
- [ITU.G872]

optical transport networks ", ITU-T Recommendation G.872, November 2001.

9.2. Informative References

[I-D.kunze-g-698-2-management-control-framework]

Kunze, R., "A framework for Management and Control of optical interfaces supporting G.698.2", [draft-kunze-g-698-2-management-control-framework-00](#) (work in progress), July 2011.

[I-D.galimbe-kunze-g-698-2-snmp-mib]

Kunze, R. and D. Hiremagalur, "A SNMP MIB to manage black-link optical interface parameters of DWDM applications", [draft-galimbe-kunze-g-698-2-snmp-mib-02](#) (work in progress), March 2012.

Authors' Addresses

Dharini Hiremagalur (editor)
Juniper
1194 N Mathilda Avenue
Sunnyvale - 94089 California
USA

Phone: +1408
Email: dharinih@juniper.net

Gert Grammel (editor)
Juniper
1194 N Mathilda Avenue
Sunnyvale - 94089 California
USA

Phone: +1408
Email: ggrammel@juniper.net

John E. Drake (editor)
Juniper
1194 N Mathilda Avenue
HW-US, Pennsylvania
USA

Phone: +1408
Email: jdrake@juniper.net

Gabriele Galimberti (editor)
Cisco
Via Philips,12
20052 - Monza
Italy

Phone: +390392091462
Email: ggalimbe@cisco.com

Zafar Ali (editor)
Cisco
3000 Innovation Drive
KANATA
ONTARIO K2K 3E8

Email: zali@cisco.com

Ruediger Kunze (editor)
Deutsche Telekom
Dddd, xx
Berlin
Germany

Phone: +49xxxxxxxxxxx
Email: RKunze@telekom.de

