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J. Ryoo
T. Cheung
ETRI
H. van Helvoort
Hai Gaoming BV
I. Busi
G. Weng
Huawei Technologies

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Updates to MPLS Transport Profile (MPLS-TP) Linear Protection in Automatic Protection Switching (APS) Mode draft-ryoo-mpls-tp-aps-updates-00.txt

Abstract

This document contains updates to MPLS Transport Profile (MPLS-TP) linear protection in Automatic Protection Switching (APS) mode defined in RFC 7271. The updates provide rules related to the initialization of the Protection State Coordination (PSC) Control Logic, in which the state machine resides, when operating in APS mode.

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 28, 2016.

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1. Introduction

MPLS Transport Profile (MPLS-TP) linear protection in Automatic Protection Switching (APS) mode is defined in RFC 7271 [RFC7271]. The actions being performed at the initialization of the Protection State Coordination (PSC) Control Logic are not described in either [RFC7271] or RFC 6378 [RFC6378]. Although it is a common perception that the state machine starts at the Normal state (but, not explicitly specified in any of the documents), various questions have been raised concerning the detailed actions that the PSC Control Logic should take.

The state machine described in [RFC7271] operates under the assumption that both end nodes of linear protection domain start in the Normal state. In the case that one node reboots while the other node is still in operation, various scenarios may arise resulting in problematic situations. This document is intended to resolve all the problematic cases and to minimize traffic disruptions related to initialization including both warm and cool reboots.

This document contains updates to the MPLS Transport Profile (MPLS-TP) linear protection in Automatic Protection Switching (APS) mode defined in [RFC7271]. The updates provide rules related to initialization of the PSC Control Logic, in which the state machine resides, when operating in APS mode. The updates also include modifications to the state transition table defined in Section 11.2

of [RFC7271]. The changes in the state transition table were examined to make sure that they do not introduce any new problems.

This document does not introduce backward compatibility issues with implementations of [RFC7271]. In case a node implementing this document restarts, the new state changes will not cause problems at the remote node implementing [RFC7271] and the two ends will converge to the same local and remote states. In case a node implementing [RFC7271] restarts, the two ends behave as of today.

The reader of this document is assumed to be familiar with [RFC7271]. This document shares the acronyms defined in Section 3 of [RFC7271].

2. Conventions Used in This Document

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].

3. Updates

This document updates [RFC7271] by specifying the actions that will be performed at the initialization of the PSC Control Logic and modifies the state transition table defined in Section 11.2 of [RFC7271].

3.1. Initialization Behavior

When the PSC Control Logic is initialized, the following actions MUST be performed:

- Stop the WTR timer if it is running.
- Clear any operator command in the Local Request Logic.
- If an SF-W or SF-P exists as the highest local request, transit to the PF:W:L or UA:P:L state, respectively.
- In case any local SD exists, the local SD MUST be considered as an input to the Local Request Logic only after the local node responds to the first protocol message from the remote node.
- When the node being initialized has no local request other than SF:
  - If the node being initialized does not remember the active path or if the node being initialized remembers the working path as the active path, send NR(0,0) in Normal state.

* If the node being initialized remembers the protection path as the active path, send either NR(0,1) in WTR state or DNR(0,1) in DNR state depending on the configuration.

o When the local node receives an EXER message as the first protocol message after rebooting and the remote EXER becomes the top-priority global request, align the position of the bridge and selector with the Path value in the EXER message and transit to the E::R state .

Remembering the active path in case of no local request is intended to minimize traffic switchovers in case that the other node is still in operation and does not cause any problem even if the remembered active path is not valid any more due to any local input at the other node while the initializing node is out of operation.

3.2. State Transition Modification

State transition by remote message defined in Section 11.2 of [RFC7271] MUST be modified as follows (only modified cells are shown):

	MS-W	MS-P	WTR	EXER	RR	DNR	NR
N			(13)			DNR	
PF:W:R						DNR	
PF:DW:R						DNR	

4. IANA Considerations

This document makes no request of IANA.

Note to RFC Editor: this section may be removed on publication as an RFC.

5. Security Considerations

No specific security issue is raised in addition to those ones already documented in [RFC7271]

6. References

6.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <http://www.rfc-editor.org/info/rfc2119>.

[RFC7271] Ryoo, J., Ed., Gray, E., Ed., van Helvoort, H., D'Alessandro, A., Cheung, T., and E. Osborne, "MPLS Transport Profile (MPLS-TP) Linear Protection to Match the Operational Expectations of Synchronous Digital Hierarchy, Optical Transport Network, and Ethernet Transport Network Operators", RFC 7271, DOI 10.17487/RFC7271, June 2014, <http://www.rfc-editor.org/info/rfc7271>.

6.2. Informative References

[RFC6378] Weingarten, Y., Ed., Bryant, S., Osborne, E., Sprecher, N., and A. Fulignoli, Ed., "MPLS Transport Profile (MPLS-TP) Linear Protection", RFC 6378, DOI 10.17487/RFC6378, October 2011, <http://www.rfc-editor.org/info/rfc6378>.

Authors' Addresses

Jeong-dong Ryoo
ETRI

EMail: ryoo@etri.re.kr

Taesik Cheung
ETRI

EMail: cts@etri.re.kr

Huub van Helvoort
Hai Gaoming BV

EMail: huubatwork@gmail.com

Italo Busi
Huawei Technologies

EMail: Italo.Busi@huawei.com

Guangjuan Weng
Huawei Technologies

EMail: wenguangjuan@huawei.com