Network Working Group
Internet-Draft
Intended status: Standards Track
Expires: August 17, 2013

A. D'Alessandro
Telecom Italia
J. Ryoo
ETRI
February 13, 2013

Supporting the Exercise command for PSC linear protection protocol
draft-dj-mpls-tp-exer-psc-00

Abstract

This draft indicates how IETF RFC6378 could be modified to address the Exercise function.

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 August 17, 2013.

Table of Contents

1. Introduction

Exercise is a command to test if the PSC communication is operating correctly. More specifically, the Exercise is to test and validate the linear protection mechanism and PSC protocol including the integrity of the protection path, without triggering the actual traffic switching. It is used while the working path is either carrying the traffic or not. It is lower priority than any "real" switch request. It is only valid in bidirectional switching, since this is the only place where one can get a meaningful test by looking for a response.

This command is documented in R84 of [RFC5654] and it has been identified as a requirement in the ITU's liaison statement "Liaison Statement: Recommendation ITU-T G.8131/Y.1382 revision - Linear protection switching for MPLS-TP networks " [LIAISON1] and "Recommendation ITU-T G.8131 revision - Linear protection switching for MPLS-TP networks [LIAISON2]. This draft is created as an attempt to align PSC behaviour and functionalities to meet IETF and ITU-T MPLS Transport Profile requirements.

2. Updates to the PSC RFC

This section describes the changes required to cover the exercise functionality to the PSC protocol defined in [RFC6378]

2.1. Updates to Section 2.1. Acronyms

The following text should be added in Section 2.1 in [RFC6378]:

EXER Exercise
RR Reverse Request

2.2. Updates to Section 3.1. Local Request Logic

EXER should be included as an operator command.

The following text should be added:

- Exercise (EXER) - Exercise is a command to test if the PSC communication is operating correctly. It is lower priority than any "real" switch request. It is only valid in bidirectional switching, since this is the only place where one can get a meaningful test by looking for a response.

  The Exercise command shall be issued with the same FPath and Path numbers of the NR, RR or DNR request that it replaces.

2.3. Update to Section 3.2. Remote Requests

The following text should be added:

- Remote EXER - the valid response to EXER message will be an RR with the corresponding FPath and Path numbers. The near end will signal a Reverse Request (RR) only in response to an EXER command from the far end.

  When Exercise commands are input at both ends, an EXER, instead of RR, is transmitted from both ends.

2.4. Updates to Section 3.6. PSC Control States

The following text should be added:

- Exercise state - The operator has issued the Exercise command to test and validate the protection mechanism and PSC protocol including the integrity of the protection path, without triggering the actual traffic switching.

2.5. Updates to Section 4.2.2. PSC Request Field

The following PSC Requests should be added to PSC Request field:

(3) Exercise - indicates that the transmitting end point is exercising the protection channel and mechanism.

(2) Reverse Request - indicates that the transmitting end point is responding to an EXER command from the far end.

2.6. Updates to Section 4.3.2. Priority of Inputs

The priority of the Exercise should be inserted between the priorities of WTR Expires and No Request.

2.7. Updates to Section 4.3.3. Operation of PSC States

2.7.1. Updates to Section 4.3.3.1. Normal State

Add the following text for Section 4.3.3.1. Normal State:

- A local Exercise input SHALL cause the LER to go into local Exercise state and begin transmission of an EXER(0,0) message.

- A remote EXER message SHALL cause the LER to go into remote Exercise state, and transmit an RR(0,0)message.

2.7.2. Updates to Section 4.3.3.6. Do-not-Revert State

Add the following text for Section 4.3.3.6. Do-not-Revert State:

- A local Exercise input SHALL cause the LER to go into local Exercise state and begin transmission of an EXER(0,1) message.

- A remote EXER message SHALL cause the LER to go into remote Exercise state, and transmit an RR(0,1)message.

2.7.3. New subsection for Exercise State

Add a new sub-section, Section 4.3.3.7. Exercise State, with the following text:

In the Exercise state, the user data traffic SHALL remain on the same path as the previous state, such as N or DNR. The local end SHALL signal a RR message in response to a remote EXER message. When both ends are in local Exercise state, only the EXER messages are exchanged.

The following describe the reaction to local input:

- A local Clear SHALL be ignored if in remote Exercise state. If in local Exercise state, then this input SHALL cause the LER to go into Normal state when the LER is configured for revertive mode. For non-revertive mode, the LER goes into DNR state.

- A local Lockout of protection input SHALL cause the LER to go into local Unavailable state and begin transmission of an LO(0,0) message.

- A local Forced Switch input SHALL cause the LER to go into local Protecting administrative state and begin transmission of an FS(1,1) message.

- A local Signal Fail indication on the protection path SHALL cause the LER to go into local Unavailable state and begin transmission of an SF(0,0) message.

- A local Signal Fail indication on the working path SHALL cause the LER to go into local Protecting failure state and begin transmission of an SF(1,1) message.

- A local Manual Switch input SHALL cause the LER to go into local Protecting administrative state and begin transmission of an MS(1,1) message.

- A local EXER input can be applied when the local end is in remote EXER state. This SHALL cause the LER to remain in the EXER state, but begin transmission of an EXER message instead of RR message.

- All other local inputs SHALL be ignored.

When in Exercise state, the following describe the reaction to remote messages:

- A remote Lockout of protection message SHALL cause the LER to go into remote Unavailable state and begin transmission of an NR(0,0) message.

- A remote Forced Switch message SHALL cause the LER to go into remote Protecting administrative state and begin transmission of an NR(0,1) message.

- A remote Signal Fail message for the protection path SHALL cause the LER to go into remote Unavailable state and begin transmission of an NR(0,0) message.

- A remote Signal Fail message for the working path SHALL cause the LER to go into remote Protecting failure state and begin transmission of an NR(0,1) message.

- A remote Manual Switch message SHALL cause the LER to go into remote Protecting administrative state and begin transmission of an NR(0,1) message.

- A remote DNR message received in remote Exercise state SHALL cause the LER to go into DNR state. A remote DNR message in local Exercise state is ignored.

- A remote NR message received in remote Exercise state SHALL cause the LER to go into Normal state. A remote NR message in local Exercise state is ignored.

- All other local inputs SHALL be ignored.

2.8. Updates to Appendix A. PSC State Machine Tables

Add the following extended states:

```
E::L = Exercise due to local EXER command
E::R = Exercise due to remote EXER message
```

Add the following messages:

```
State REQ(FP, P)
----- ----------
E::L  EXER(0,0)for revertive, or EXER(0,1)for non-revertive
E::R  RR(0,0) for revertive, or RR(0,1) for non-revertive
```

Modify the state machine as follows (only relevant cells are shown):

Part 1: Local input state machine

	OC	LO	SF-P	FS	SF-W	SFc	MS	WTREx p	EXE R
N									E::L
UA:L O:L									i
UA:P :L									i
UA:L O:R									i
UA:P :R									i
PF:W :L									i
PF:W :R									i
PA:F :L									i
PA:M :L									i
PA:F :R									i
PA:M :R									i
WTR									i
DNR									E::L
E::L	[20]	UA:L O:L	UA:P :L	PA:F :L	PF:W :L	i	PA:M: L	i	i
E::R	i	UA:L O:L	UA:P :L	PA:F :L	PF:W :L	i	PA:M: L	i	E::L

Part 2: Remote messages state machine

	LO	SF-P	FS	SF-W	MS	WTR	DNR	NR	EXER	RR
N									E::R	i
UA:LO:L									i	i
UA:P:L									i	i
UA:LO:R									i	i
UA:P:R									i	i
PF:W:L									i	i
PF:W:R									i	i
PA:F:L									i	i
PA:M:L									i	i
PA:F:R									i	i
PA:M:R									i	i
WTR									i	i
DNR									E::R	i
E::L	UA:LO:R	UA:P:R	PA:F:R	PF:W:R	PA:M:R	i	i	i	i	i

E::R	UA:L	UA:	PA:	PF:W	PA:M	i	DNR	N	i	i
	O:R	P:R	F:R	:R	:R					

[20] Transition to N for revertive mode, transition to DNR for non-revervtive mode

2.9. Updates to Appendix B. Exercising the Protection Domain

Remove Appendix B.

3. IANA Considerations

This document makes no request of IANA.

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

4. Security Considerations

No specific security issue is raised in addition to those ones already documented in [RFC6378]

5. Acknowledgements

6. References

6.1. Normative References

[RFC5654] Niven-Jenkins, B., Brungard, D., Betts, M., Sprecher, N., and S. Ueno, "Requirements of an MPLS Transport Profile", RFC 5654, September 2009.

[RFC6378] Weingarten, Y., Bryant, S., Osborne, E., Sprecher, N., and A. Fulignoli, "MPLS Transport Profile (MPLS-TP) Linear Protection", RFC 6378, October 2011.

6.2. Informative References

[LIAISON1] ITU-T SG15, "Liaison Statement: Recommendation ITU-T G.8131/Y.1382 revision - Linear protection switching for MPLS-TP networks", <https://datatracker.ietf.org/liaison/1205/>.

[LIAISON2] ITU-T SG15, "Liaison Statement: Recommendation ITU-T G.8131 revision - Linear protection switching for MPLS-TP networks", <https://datatracker.ietf.org/liaison/1234/>.

Authors' Addresses

Alessandro D'Alessandro
Telecom Italia
via Reiss Romoli, 274
Torino 10141
Italy

Phone: +30 011 2285887
Email: alessandro.dalessandro@telecomitalia.it

Jeong-dong Ryoo
ETRI
218 Gajeongno
Yuseong-gu, Daejeon 305-700
South Korea

Phone: +82-42-860-5384
Email: ryoo@etri.re.kr