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Simple Two-way Active Measurement Protocol Optional Extensions  
draft-mirsky-ippm-stamp-option-tlv-00

## Abstract

This document describes an optional extensions to Simple Two-way Active Measurement Protocol (STAMP) which enable measurement performance metrics in addition to ones enabled by the STAMP base specification.

## Status of This Memo

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## [1.](#) Introduction

Simple Two-way Active Measurement Protocol (STAMP)

[\[I-D.ietf-ippm-stamp\]](#) supports use of optional extensions that use Type-Length-Value (TLV) encoding. Such extensions are to enhance the STAMP base functions, such as measurement of one-way and round-trip delay, latency, packet loss, as well as ability to detect packet duplication and out-of-order delivery of the test packets. This specification provides definitions of optional STAMP extensions, their formats and theory of operation.

## [2.](#) Conventions used in this document

### [2.1.](#) Terminology

STAMP - Simple Two-way Active Measurement Protocol

DSCP - Differentiated Services Code Point

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ECN - Explicit Congestion Notification

NTP - Network Time Protocol

PTP - Precision Time Protocol

HMAC Hashed Message Authentication Code

TLV Type-Length-Value

## [2.2.](#) Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

## [3.](#) Theory of Operation

STAMP Session-Sender transmits test packets toward STAMP Session-Reflector. STAMP Session-Reflector receives Session-Sender's packet and acts according to the configuration and optional control information communicated in the Session-Sender's test packet. STAMP defines two different test packet formats, one for packets transmitted by the STAMP-Session-Sender and one for packets transmitted by the STAMP-Session-Reflector. STAMP supports three modes: unauthenticated, authenticated, and encrypted. Unauthenticated STAMP test packets are compatible on the wire with unauthenticated TWAMP-Test [[RFC5357](#)] packet formats.

By default STAMP uses symmetrical packets, i.e. size of the packet transmitted by Session-Reflector equals to the size of the packet received by the Session-Reflector.

## [4.](#) TLV Extensions to STAMP

TBA

#### 4.1. Extra Padding TLV

TBA

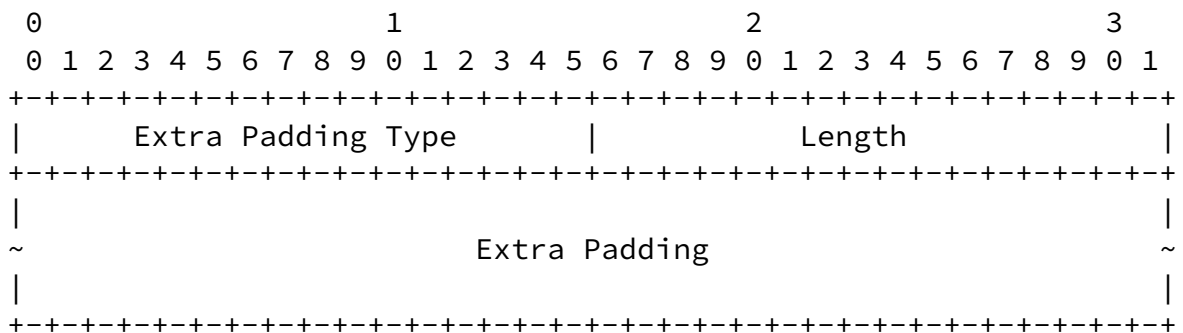


Figure 1: Extra Padding TLV

where fields are defined as the following:

- o Extra Padding Type - TBA1 allocated by IANA [Section 5.1](#)
- o Length - 2 octets long field equals length on the Extra Padding field in octets.
- o Extra Padding - pseudo-random sequence of numbers. The field MAY be filled with all zeroes.

#### 4.2. Location TLV

STAMP session-sender MAY include the Location TLV to request information from the session-reflector. The session-sender SHOULD NOT fill any information fields except for Type and Length. The session-reflector MUST validate the Length value against address family of the transport encapsulating the STAMP test packet. If the

value of the Length field is invalid, the session-reflector MUST zero all fields and MUST NOT return any information to the session-sender. The session-reflector MUST ignore all other fields of the received Location TLV.

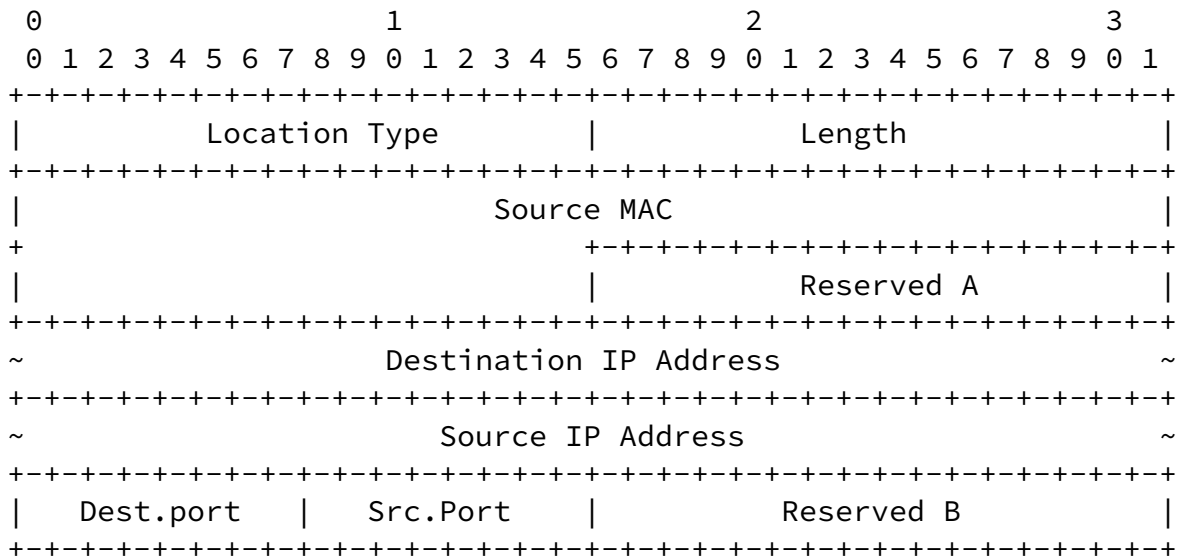


Figure 2: Session-Reflector Location TLV

where fields are defined as the following:

- o Location Type - TBA2 allocated by IANA [Section 5.1](#)



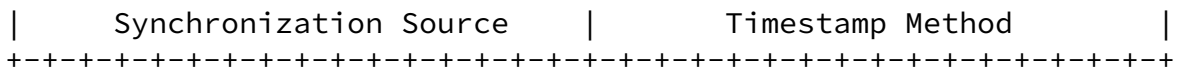


Figure 3: Timestamp Information TLV

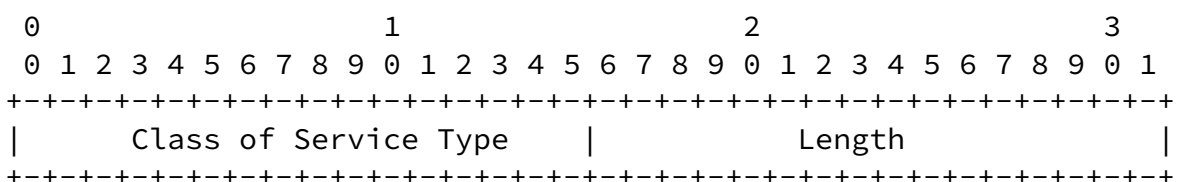
where fields are defined as the following:

- o Timestamp Information Type - TBA3 allocated by IANA [Section 5.1](#)
- o Length - 2 octets long field, equals 4 octets.
- o Synchronization Source - two octets long field that characterizes the source of clock synchronization at the session-reflector. The value is one of [Section 5.2](#).
- o Timestamp Method - two octets long field that characterizes timestamping method at the session-reflector. The value is one of [Section 5.3](#). [Ed.note: Should it be split for ingress and egress?]

#### [4.4.](#) Class of Service TLV

The STAMP session-sender MAY include Class of Service TLV in the STAMP test packet. If the Class of Service TLV is present in the STAMP test packet and the value of the Op field equals Report (TBA5) value [Section 5.4](#), then the STAMP session-reflector MUST copy Differentiated Services Code Point (DSCP) and Explicit Congestion Notification (ECN) values from the received STAMP test packet into DSCP and ECN fields of the Class of Service TLV of the reflected STAMP test packet. If the value of the Op field equals Set and Report (TBA6) [Section 5.4](#), then the STAMP session-reflector MUST use DSCP value from the Class of Service TLV in the received STAMP test packet as DSCP value of STAMP reflected test packet and MUST copy

DSCP and ECN values of the received STAMP test packet into DSCP and ECN fields of Class of Service TLV in the STAMP reflected packet.









Value	Description	Reference
0	Reserved	This document
1- 32759	Unassigned	IETF Review
32760 - 65279	Unassigned	First Come First Served
65280 - 65519	Experimental	This document
65520 - 65534	Private Use	This document
65535	Reserved	This document

Table 1: STAMP TLV Type Registry

This document defines the following new values in STAMP TLV Type registry:

Value	Description	Reference
TBA1	Extra Padding	This document
TBA2	Location	This document
TBA3	Timestamp Information	This document
TBA4	Class of Service	This document
TBA5	Direct Measurement	This document

Table 2: STAMP Types

## [5.2.](#) Synchronization Source Sub-registry

TBD

## [5.3.](#) Timestamp Method Sub-registry

TBD

## [5.4.](#) CoS Operation Sub-registry

TBD

## [6.](#) Security Considerations

Use of HMAC in authenticated and encrypted modes may be used to simultaneously verify both the data integrity and the authentication of the STAMP test packets.

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## 7. Acknowledgments

TBD

## 8. Normative References

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