Internet Engineering Task Force (IETF)
Request for Comments: 6776
Category: Standards Track
ISSN: 2070-1721

A. Clark
Telchemy
Q. Wu
Huawei

October 2012

Measurement Identity and Information Reporting Using a Source Description (SDES) Item and an RTCP Extended Report (XR) Block

Abstract

This document defines an RTP Control Protocol (RTCP) Source Description (SDES) item and an RTCP Extended Report (XR) block carrying parameters that identify and describe a measurement period to which one or more other RTCP XR blocks may refer.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc6776.

Table of Contents

1. Introduction

This document defines one new RTP Control Protocol (RTCP) Source Description (SDES) [RFC3550] item and one new Extended Report (XR) block carrying parameters that identify and describe a measurement period to which one or more other RTCP XR blocks may refer.

The SDES item provides a field for an application-specific auxiliary identifier. This identifier may be used to correlate data in XR blocks within an RTP session with data from a non-RTP session.

An RTCP Measurement Identity SDES packet may be associated with a set of RTCP XR metrics blocks that share the same application-specific measurement identifier.

The XR block does not contain any measurement results (metrics). Instead, it provides information relevant to a measurement reported in one or more other block types, including:

- the sequence number of the first packet of the RTP session,

- the extended sequence numbers of the first packet of the current measurement interval, and the last packet included in the measurement,

- the duration of the most recent measurement interval, and

- the duration of the interval applicable to cumulative measurements (which may be the duration of the RTP session to date).

The calculation method of the extended RTP sequence number is provided in the Real-time Transport Protocol (RTP) [RFC3550].

The RTCP XR block containing the measurement information is intended to provide a single copy of the information necessary to relate measurement data in the RTCP XR blocks to the stream and measurement period to which they refer. Commonly, multiple other small metric blocks contain measurement data for the same stream and period, and overhead would be large if all of these metric blocks carried duplicated data for measurement identification.

The RTCP XR block may be associated with a set of RTCP XR metrics blocks that share the same information relevant to a reported measurement. There may be several such sets in an RTCP packet, in which each set shares the same information relevant to a reported measurement. There may also be RTCP XR blocks in the packet that are not associated with a Measurement Information block, for example, blocks that were defined before the Measurement Identity and information mechanism were introduced by this document.

1.1. RTCP and RTCP XRs

The use of RTCP for reporting is defined in [RFC3550]. [RFC3611] defines an extensible structure for reporting by using an RTCP XR. [RFC3611] also defines the use of XR blocks. This document defines a new Extended Report block.

1.2. Performance Metrics Framework

The Performance Metrics Framework [RFC6390] provides guidance on the definition and specification of performance metrics. The RTP Monitoring Architectures [MONARCH] provides guidelines for reporting block format using RTCP XR. The SDES item and XR block described in this document are in accordance with [RFC6390] and [MONARCH].

1.3. Applicability

The RTCP SDES item and the RTCP XR block defined in this document provide information relevant to the measurements for members of a family of RTCP XR metrics blocks that are designed to use it. To use the mechanism defined here, the RTCP XR block containing measurement information is not required to be in the same RTCP packet as the SDES item containing measurement identity.

2. Terminology

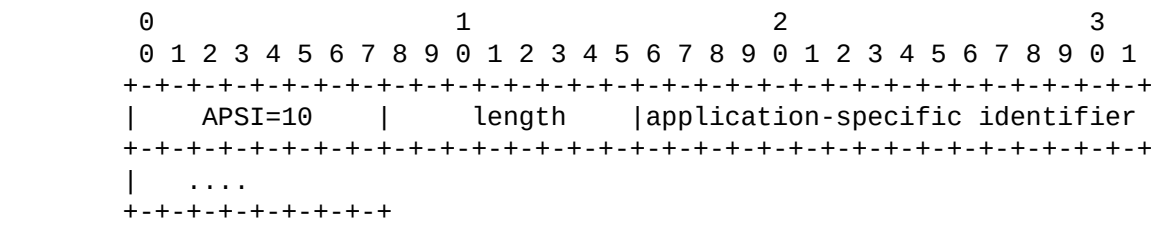
2.1. Standards Language

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].

3. Measurement Identity SDES Item

This section defines the format of the Measurement Identity SDES item. The SDES item is carried in the RTCP SDES packet. The packet format for the RTCP SDES is defined in Section 6.5 of [RFC3550]. Each SDES packet is composed of a header with fixed-length fields for version, source count, packet type (PT), and length, followed by zero or more SDES items. In the SDES packet, the PT field is set to SDES (202).

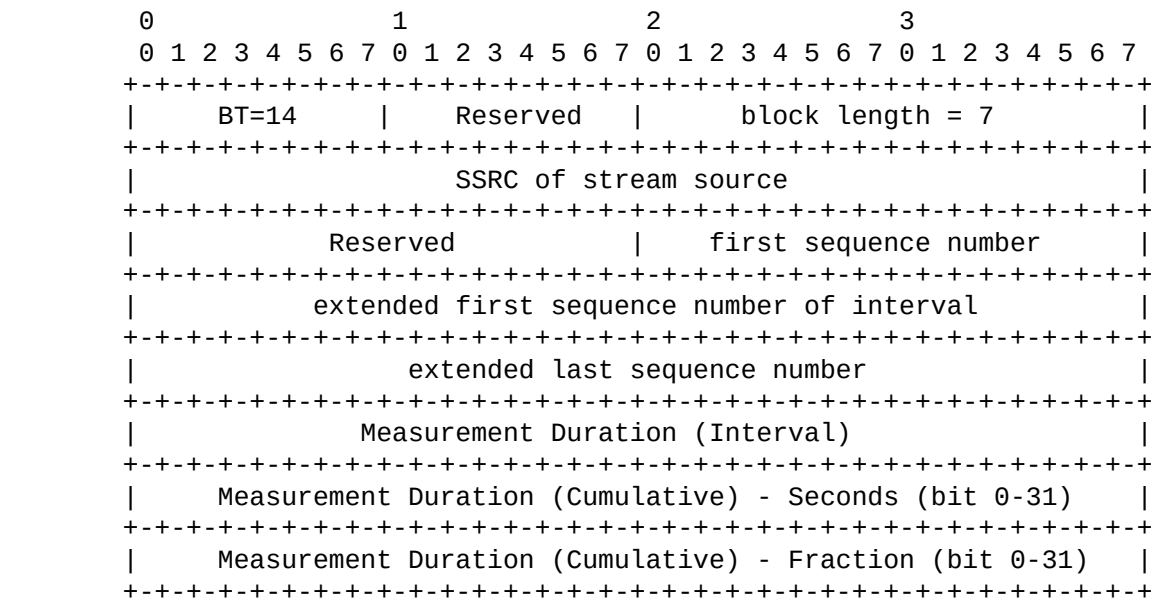
3.1. APSI: Application-Specific Identifier SDES Item



The application-specific identifier is an additional identifier that is useful in the context of a specific application, e.g., an MPEG-2 transport identifier [MPEG2]. This item MUST be ignored by applications that are not configured to make use of it. The identifier is variable length. Its length is described by the length field. The value of the length field does not include the two-octet SDES item header.

4. Measurement Information XR Block

4.1. Report Block Structure



Report Block Structure

4.2. Definition of Fields in Measurement Information Report Block

Block type (BT): 8 bits

A Measurement Information Block is identified by the constant 14.

Reserved: 8 bits

These bits are reserved. They MUST be set to zero by senders and ignored by receivers.

Block Length: 16 bits

The length of this report block in 32-bit words minus one. For the Measurement Information Block, the block length is equal to 7.

SSRC of source: 32 bits

As defined in Section 4.1 of [RFC3611].

Reserved: 16 bits

These bits are reserved. They MUST be set to zero by senders and ignored by receivers.

First sequence number: 16 bits

The RTP sequence number of the first received RTP packet of the session, used to determine the number of packets contributing to cumulative measurements.

Extended first sequence number of interval: 32 bits

The extended RTP sequence number of the first received RTP packet of the current measurement interval. The extended sequence number is expressed as the low 16-bit value containing the sequence number received in an RTP data packet and the most significant 16-bit value containing the corresponding count of sequence number cycles. For additional information on extended sequence numbers, see the "extended highest sequence number received" definition in Section 6.4.1 of RFC 3550 and Appendix A.1 of RFC 3550.

Extended last sequence number: 32 bits

The extended RTP sequence number of the last received RTP packet that contributed to this measurement. The extended sequence number is expressed as the low 16-bit value containing the sequence number received in an RTP data packet and the most significant 16-bit value containing the corresponding count of sequence number cycles. For additional information on extended sequence numbers, see the "extended highest sequence number received" definition in Section 6.4.1 of RFC 3550 and Appendix A.1 of RFC 3550.

Measurement Duration (Interval): 32 bits

The duration, expressed in units of 1/65536 seconds, of the reporting interval applicable to Interval reports that use this Measurement Information Block. The value of this field can be calculated by the receiver of the RTP media stream, for example, based on received RTP media packets or using the RTCP method described in [RFC3550].

Measurement Duration (Cumulative): 64 bits

The duration of the reporting interval applicable to Cumulative reports that use this Measurement Information Block. The value of this field is represented using a 64-bit NTP-format timestamp as defined in [RFC5905], which is a 64-bit unsigned fixed-point number with the integer part in the first 32 bits and the fractional part in the last 32 bits. It can be calculated by the receiver of the RTP media stream, for example, based on received RTP media packets or using the RTCP method described in [RFC3550].

5. IANA Considerations

A new SDES item type for RTCP SDES and a new XR block type for RTCP XR have been registered with IANA. For general guidelines on IANA considerations, refer to [RFC3550] for RTCP SDES and [RFC3611] for RTCP XR.

5.1. New RTCP SDES Item Type Value

This document adds the Measurement Identity SDES item to the IANA "RTP SDES item types" registry as follows:

abbrev.	name	value
APSI	Application-Specific Identifier	10

5.2. New RTCP XR Block Type Value

This document assigns the block type value 14 in the IANA "RTCP XR Block Type Registry" to the "Measurement Information Block".

5.3. Contact Information for Registrations

The contact information for the registrations is:

Qin Wu (sunseawq@huawei.com)
101 Software Avenue, Yuhua District
Nanjing, Jiangsu 210012
China

6. Security Considerations

RTCP reports can contain sensitive information, including information about the nature and duration of a session established between two or more endpoints. Therefore, the use of security mechanisms with RTP, as documented in Section 9 of [RFC3550], applies.

7. References

7.1. Normative References

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

[RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, RFC 3550, July 2003.

[RFC3611] Friedman, T., Ed., Caceres, R., Ed., and A. Clark, Ed., "RTP Control Protocol Extended Reports (RTCP XR)", RFC 3611, November 2003.

[RFC5905] Mills, D., Martin, J., Ed., Burbank, J., and W. Kasch, "Network Time Protocol Version 4: Protocol and Algorithms Specification", RFC 5905, June 2010.

7.2. Informative References

[MONARCH] Wu, Q., Hunt, G., and P. Arden, "Monitoring Architectures for RTP", Work in Progress, September 2012.

[MPEG2] ISO/IEC, "Standard 13818-1, Information technology -- Generic coding of moving pictures and associated audio information: Systems", October 2007.

[RFC6390] Clark, A. and B. Claise, "Guidelines for Considering New Performance Metric Development", BCP 170, RFC 6390, October 2011.

Authors' Addresses

Alan Clark
Telchemy Incorporated
2905 Premiere Parkway, Suite 280
Duluth, GA 30097
United States

EMail: alan.d.clark@telchemy.com

Qin Wu
Huawei
101 Software Avenue, Yuhua District
Nanjing, Jiangsu 210012
China

EMail: sunseawq@huawei.com