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G. Hunt
Unaffiliated
A. Clark
Telchemy
K. Gross
AVA Networks
Q. Wu
Huawei

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RTCP XR Report Block for Delay metric Reporting
draft-ietf-xrblock-rtcp-xr-delay-03.txt

Abstract

This document defines an RTCP XR Report Block that allows the reporting of Delay metrics for use in a range of RTP applications.

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 October 23, 2012.

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1. Introduction

1.1. Packet Delay Metrics Block

This draft defines a new block type to augment those defined in [RFC3611] for use in a range of RTP applications. The new block type supports the reporting of the mean, minimum and maximum values of the network round-trip delay between RTP interfaces in peer RTP end systems as measured, for example, using the RTCP method described in [RFC3550]. It also supports reporting of the component of the round-trip delay internal to the local RTP system.

The network metrics belong to the class of packet transport delay metrics defined in [MONARCH] (work in progress).

1.2. RTCP and RTCP XR Reports

The use of RTCP for reporting is defined in [RFC3550]. [RFC3611] defined an extensible structure for reporting using an RTCP Extended Report (XR). This draft defines a new Extended Report block that MUST be used as defined in [RFC3550] and [RFC3611].

1.3. Performance Metrics Framework

The Performance Metrics Framework [RFC6390] provides guidance on the definition and specification of performance metrics. Metrics described in this draft either reference external definitions or define metrics generally in accordance with the guidelines in [RFC6390].

1.4. Applicability

These metrics are applicable to a range of RTP applications in which this report block would be useful, such as multimedia conferencing and streaming audio and video.

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. Delay Block

Metrics in this block report on packet delay in the stream arriving at the RTP system. Instances of this Metrics Block refer by SSRC to the separate auxiliary Measurement Information block [MEASI] which contains measurement intervals. This metric block relies on the measurement interval in the Measurement Information block indicating the span of the report. If the measurement interval is not received in the same compound RTCP packet as this metric block, this metric block should be discarded.

3.1. Report Block Structure

Delay metrics block

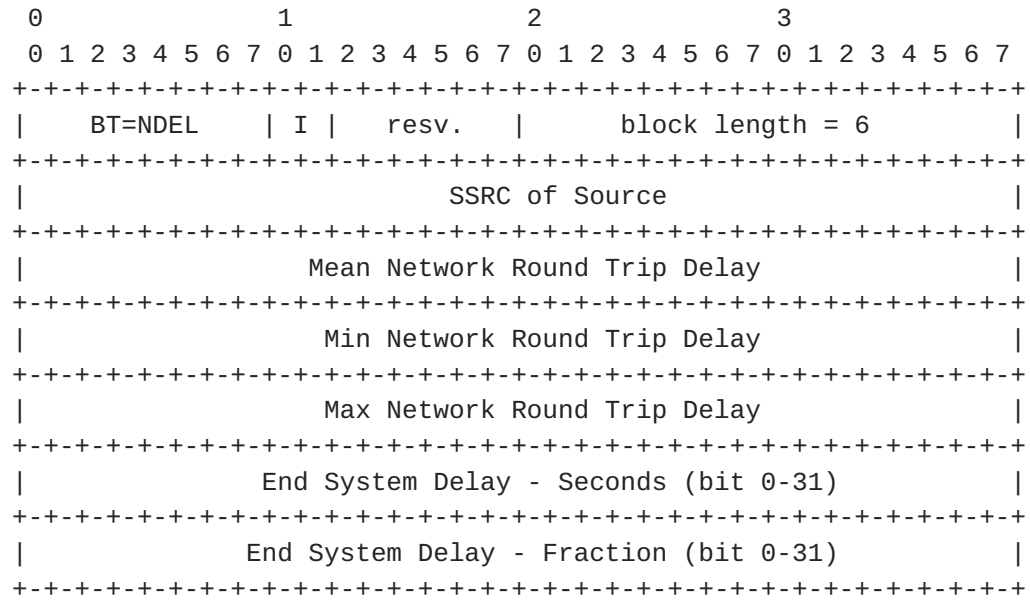

Figure 1: Report Block Structure

3.2. Definition of Fields in Delay Metrics Report Block

Block type (BT): 8 bits

A Delay Report Block is identified by the constant NDEL.

[Note to RFC Editor: please replace NDEL with the IANA provided RTCP XR block type for this block.]

Interval Metric flag (I): 2 bit

This field is used to indicate whether the Delay metrics are Sampled, Interval or Cumulative metrics, that is, whether the reported values applies to the most recent measurement interval duration between successive metrics reports (I=10) (the Interval Duration) or to the accumulation period characteristic of cumulative measurements (I=11) (the Cumulative Duration) or to the value of a continuously measured or calculated that has been sampled at end of the interval (I=01) (Sampled Value).

Reserved (resv): 6 bits

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

block length: 16 bits

The length of this report block in 32-bit words, minus one. For the Delay block, the block length is equal to 6.

SSRC of source: 32 bits

As defined in Section 4.1 of [RFC3611].

Mean Network Round Trip Delay: 32 bits

The Mean Network Round Trip Delay is the mean value of the RTP-to-RTP interface round trip delay over the measurement period, expressed in units of 1/65536 seconds. This value is typically determined using RTCP SR/RR.

If only one measurement of Round Trip Delay is available for the timespan of the report (whether Interval or Cumulative), this single value should be reported as the mean value.

If the measurement is unavailable, the value 0xFFFFFFFF SHOULD be reported.

Min Network Round Trip Delay: 32 bits

The Min Network Round Trip Delay is the minimum value of the RTP-to-RTP interface round trip delay over the measurement period,

expressed in units of 1/65536 seconds. This value is typically determined using RTCP SR/RR.

If only one measurement of Round Trip Delay is available for the timespan of the report (whether Interval or Cumulative), this single value should be reported as the minimum value.

If the measurement is unavailable, the value 0xFFFFFFFF SHOULD be reported.

Max Network Round Trip Delay: 32 bits

The Max Network Round Trip Delay is the maximum value of the RTP-to-RTP interface round trip delay over the measurement period, expressed in units of 1/65536 seconds. This value is typically determined using RTCP SR/RR.

If only one measurement of Round Trip Delay is available for the timespan of the report (whether Interval or Cumulative), this single value should be reported as the maximum value.

If the measurement is unavailable, the value 0xFFFFFFFF SHOULD be reported.

End System Delay: 64 bits

The End System Delay is the internal round trip delay within the reporting endpoint, calculated using the nominal value of the jitter buffer delay plus the accumulation/encoding and decoding/ playout delay associated with the codec being used. The value of this field is represented using a 64-bit NTP-format timestamp as defined in [RFC5905], which is 64-bit unsigned fixed-point number with the integer part in the first 32 bits and the fractional part in the last 32 bits.

If the measurement is unavailable, the value 0xFFFFFFFF SHOULD be reported.

4. SDP Signaling

[RFC3611] defines the use of SDP (Session Description Protocol) [RFC4566] for signaling the use of XR blocks. XR blocks MAY be used without prior signaling.

This section augments the SDP [RFC4566] attribute "rtcp-xr" defined in [RFC3611] by providing an additional value of "xr-format" to signal the use of the report block defined in this document.

```
rtcp-xr-attrib = "a=" "rtcp-xr" ":" [xr-format *(SP xr-format)] CRLF

(defined in [RFC3611])

xr-format =/ xr-delay-block

xr-delay-block ="delay"
```

5. IANA Considerations

New block types for RTCP XR are subject to IANA registration. For general guidelines on IANA considerations for RTCP XR, refer to [RFC3611].

5.1. New RTCP XR Block Type value

This document assigns the block type value NDEL in the IANA "RTCP XR Block Type Registry" to the "Delay Metrics Block".

[Note to RFC Editor: please replace NDEL with the IANA provided RTCP XR block type for this block.]

5.2. New RTCP XR SDP Parameter

This document also registers a new parameter "delay" in the "RTCP XR SDP Parameters Registry".

5.3. Contact information for registrations

The contact information for the registrations is:

Geoff Hunt (r.geoff.hunt@gmail.com)

Orion 2 PP3, Adastral Park, Martlesham Heath, Ipswich IP5 3RE, United Kingdom

6. Security Considerations

It is believed that this proposed RTCP XR report block introduces no new security considerations beyond those described in [RFC3611]. This block does not provide per-packet statistics so the risk to confidentiality documented in Section 7, paragraph 3 of [RFC3611] does not apply.

7. Acknowledgments

The authors gratefully acknowledge the comments and contributions made by Bruce Adams, Philip Arden, Amit Arora, Bob Biskner, Kevin Connor, Claus Dahm, Randy Ethier, Roni Even, Jim Frauenthal, Albert Higashi, Tom Hock, Shane Holthaus, Paul Jones, Rajesh Kumar, Keith Lantz, Mohamed Mostafa, Amy Pendleton, Colin Perkins, Mike Ramalho, Ravi Raviraj, Albrecht Schwarz, Tom Taylor, and Hideaki Yamada.

8. References

8.1. Normative References

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

[RFC3550] Schulzrinne, H., "RTP: A Transport Protocol for Real-Time Applications", RFC 3550, July 2003.

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

[RFC4566] Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol", July 2006.

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

8.2. Informative References

[MEASI] Hunt, G., "Measurement Identity and information Reporting using SDES item and XR Block", ID draft-ietf-xrblock-rtcp-xr-meas-identity-06, April 2012.

[MONARCH] Hunt, G., "Monitoring Architectures for RTP", ID draft-ietf-avtcore-monarch-12, April 2012.

[RFC6390] Clark, A. and B. Claise, "Framework for Performance Metric Development", RFC 6390, October 2011.

Appendix A. Change Log

Note to the RFC-Editor: please remove this section prior to publication as an RFC.

A.1. draft-ietf-xrblock-rtcp-xr-delay-03

The following are the major changes to previous version :

- Allocate 64 bit for end system delay and represent it using 64 bit NTP-Timestamp.
- Other editorial changes.

A.2. draft-ietf-xrblock-rtcp-xr-delay-02

The following are the major changes to previous version :

- Allocate 32bits for each metrics and change unit for each metric from ms to 1/65536 seconds.

A.3. draft-ietf-xrblock-rtcp-xr-delay-01

The following are the major changes to previous version :

- Updated references.
- Allocate one more bit for Interval metric flag to indicate sampled metric can be used.
- add a few clarification text for failure mode.

A.4. draft-ietf-xrblock-rtcp-xr-delay-00

The following are the major changes to previous version :

- Changed BNF for SDP following Christian Groves' and Tom Taylor's comments (4th and 5th May 2009).
- Updated references.

Authors' Addresses

Geoff Hunt
Unaffiliated

Email: r.geoff.hunt@gmail.com

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

Email: alan.d.clark@telchemy.com

Kevin Gross
AVA Networks

Email: kevin.gross@avanw.com

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

Email: sunseawq@huawei.com