RTCP XR Report Block for Jitter Buffer Metric Reporting
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Abstract

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

Table of Contents

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1. Introduction   TOC

1.1. Jitter Buffer Metrics Block   TOC

This draft defines a new block type to augment those defined in
[RFC3611] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP
XR)," November 2003.), for use in a range of RTP applications.
The new block type provides information on jitter buffer configuration
and performance.
The metric belongs to the class of transport-related terminal metrics
defined in [MONARCH] (work in progress).
Instances of this Metrics Block refer by tag to the separate auxiliary
Measurement Identity block [MEASIDENT] (Hunt, G., "RTCP XR Measurement
Identifier Block," August 2008.) which contains information such as the
SSRC of the measured stream, and RTP sequence numbers and time
intervals indicating the span of the report.

1.2. RTCP and RTCP XR Reports   TOC

The use of RTCP for reporting is defined in [RFC3550] (Schulzrinne, H.,
"RTP: A Transport Protocol for Real-Time Applications," July 2003.).
[RFC3611] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP
XR)," November 2003.) 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] (Schulzrinne,
H., "RTP: A Transport Protocol for Real-Time Applications," July 2003.)

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

1.3. Performance Metrics Framework

The Performance Metrics Framework [PMOLFRAME] (Clark, A., "Framework for Performance Metric Development," July 2008.) 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 [PMOLFRAME] (Clark, A., "Framework for Performance Metric Development," July 2008.).

1.4. Applicability

These metrics are applicable to a range of RTP applications.

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2. Jitter Buffer Metrics Block

This block describes the configuration and operating parameters of the jitter buffer in the receiver of the RTP end system or RTP mixer which sends the report.

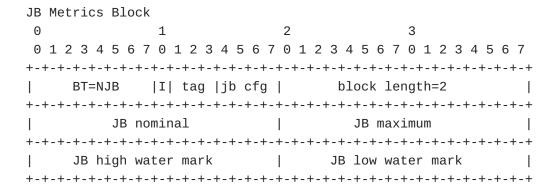
2.1. Report Block Structure

```
JB Metrics Block
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     BT=NJB     |I| tag |jb cfg |       block length=2          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|          JB nominal           |          JB maximum           |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|       JB high water mark      |       JB low water mark       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Figure 1: Report Block Structure

2.2. Definition of Fields in Jitter Buffer Metrics Block

block type (BT): 8 bits

> A Jitter Buffer Metrics Report Block is identified by the constant
> NJB.

[Note to RFC Editor: please replace NJB with the IANA provided RTCP XR
block type for this block.]
Interval Metric flag (I): 1 bit

> This field is used to indicate whether the Jitter Buffer Metrics
> block is an Interval or a Cumulative report, that is, whether the
> reported values apply to the most recent measurement interval
> duration between successive metrics reports (I=1) (the Interval
> Duration) or to the accumulation period characteristic of cumulative
> measurements (I=0) (the Cumulative Duration). Numerical values for
> both these intervals are provided in the Measurement Identifier
> block referenced by the tag field below.

Measurement Identifier association (tag): 3 bits

> This field is used to identify the Measurement Identifier block
> [MEASIDENT] (Hunt, G., "RTCP XR Measurement Identifier Block,"
> August 2008.) which describes this measurement. The relevant
> Measurement Identifier block has the same tag value as the Jitter
> Buffer Metrics block. Note that there may be more than one
> Measurement Identifier block per RTCP packet.

Jitter Buffer Configuration (jb cfg): 4 bits

This field is used to identify the jitter buffer method in use at the receiver, according to the following code:

```
            bits 014-017
                    0 = Fixed jitter buffer
                    1 = Adaptive jitter buffer
                    Other values reserved
```

block length: 16 bits

The length of this report block in 32-bit words, minus one. For the Jitter Buffer block, the block length is equal to 2.

jitter buffer nominal delay (JB nominal): 16 bits

This is the current nominal jitter buffer delay in milliseconds, which corresponds to the nominal jitter buffer delay for packets that arrive exactly on time. This parameter MUST be provided for both fixed and adaptive jitter buffer implementations.

If the measured value exceeds 0xFFFD, the value 0xFFFE SHOULD be reported to indicate an over-range measurement. If the measurement is unavailable, the value 0xFFFF SHOULD be reported.

jitter buffer maximum delay (JB maximum): 16 bits

This is the current maximum jitter buffer delay in milliseconds which corresponds to the earliest arriving packet that would not be discarded. In simple queue implementations this may correspond to the nominal size. In adaptive jitter buffer implementations, this value may dynamically. This parameter MUST be provided for both fixed and adaptive jitter buffer implementations.

If the measured value exceeds 0xFFFD, the value 0xFFFE SHOULD be reported to indicate an over-range measurement. If the measurement is unavailable, the value 0xFFFF SHOULD be reported.

jitter buffer high water mark (JB high water mark): 16 bits

This is the highest value of the jitter buffer nominal delay which occurred at any time during the reporting interval.

If the measured value exceeds 0xFFFD, the value 0xFFFE SHOULD be reported to indicate an over-range measurement. If the measurement is unavailable, the value 0xFFFF SHOULD be reported.

jitter buffer low water mark (JB low water mark): 16 bits

This is the lowest value of the jitter buffer nominal delay which occurred at any time during the reporting interval.

If the measured value exceeds 0xFFFD, the value 0xFFFE SHOULD be reported to indicate an over-range measurement. If the measurement is unavailable, the value 0xFFFF SHOULD be reported.

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3. SDP Signaling

[RFC3611] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP XR)," November 2003.) defines the use of SDP (Session Description Protocol) [RFC4566] (Handley, M., "SDP: Session Description Protocol," July 2006.) for signaling the use of XR blocks. XR blocks MAY be used without prior signaling.
This section augments the SDP [RFC4566] (Handley, M., "SDP: Session Description Protocol," July 2006.) attribute "rtcp-xr" defined in [RFC3611] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP XR)," November 2003.) 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] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP XR)," November 2003.))
xr-format = xr-format / xr-jb-block
xr-jb-block = "xr-jb"

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4. IANA Considerations

This document creates a new block type within the IANA "RTCP XR Block Type Registry" called the Jitter Buffer Metrics Block, and a new parameter xr-jb within the "RTCP XR SDP Parameters Registry".

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5. Security Considerations

It is believed that this proposed RTCP XR report block introduces no new security considerations beyond those described in [RFC3611] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP XR)," November 2003.). This block does not provide per-packet statistics so the risk to confidentiality documented in Section 7, paragraph 3 of [RFC3611] (Friedman, T., "RTP Control Protocol Extended Reports (RTCP XR)," November 2003.) does not apply.

6. Contributors

[TOC]

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7. References

[TOC]

7.1. Normative References

[TOC]

[MEASIDENT]	Hunt, G., "RTCP XR Measurement Identifier Block," ID draft-ietf-avt-rtcp-xr-measid-00, August 2008.
[RFC2119]	Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels," RFC 2119, BCP 14, March 1997.
[RFC3550]	Schulzrinne, H., "RTP: A Transport Protocol for Real-Time Applications," RFC 3550, July 2003.
[RFC3611]	Friedman, T., "RTP Control Protocol Extended Reports (RTCP XR)," RFC 3611, November 2003.
[RFC4566]	Handley, M., "SDP: Session Description Protocol," RFC 4566, July 2006.

7.2. Informative References

[TOC]

[MONARCH]	Hunt, G., "Monitoring Architectures for RTP," ID draft-hunt-avt-monarch-01, August 2008.
[PMOLFRAME]	Clark, A., "Framework for Performance Metric Development," ID draft-ietf-pmol-metrics-framework-00, July 2008.

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