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                RTCP XR Report Block for Discard metric Reporting
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Abstract

   This document defines an RTCP XR Report Block that allows the
   reporting of a simple discard count metric for use in a range of RTP
   applications.

Status of this Memo

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   provisions of BCP 78 and BCP 79.

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1. Introduction

1.1. Discard Report 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 number of packets which are received
   correctly but are never played out, typically because they arrive too
   late to be played out (buffer underflow) or too early (buffer
   overflow). The metric is applicable both to systems which use packet
   loss repair techniques (such as forward error correction [RFC5109] or
   retransmission [RFC4588]) and to those which do not.

   This metric is useful for identifying the existence, and
   characterising the severity, of a packet transport problem which may
   affect users' perception of a service delivered over RTP.

   The metric belongs to the class of transport-related terminal 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 [PMOLFRAME] 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].

1.4. Applicability

   This metric is believed to be applicable to a large class of RTP
   applications which use a jitter buffer.

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].

   In addition, the following terms are defined:

   Received, Lost and Discarded

      A packet shall be regarded as lost if it fails to arrive within an
      implementation-specific time window. A packet that arrives within
      this time window but is too early or late to be played out shall
      be regarded as discarded. A packet shall be classified as one of
      received (or OK), discarded or lost. The Discard Metric counts
      only discarded packets. The metric "cumulative number of packets
      lost" defined in [RFC3550] reports a count of packets lost from
      the media stream (single SSRC within single RTP session).
      Similarly the metric "number of packets discarded" reports a count
      of packets discarded from the media stream (single SSRC within
      single RTP session) arriving at the receiver. Another metric
      defined in [POSTREPAIRLOSS] is available to report on packets
      which are not recovered by any repair techniques which may be in
      use.

3. Discard Metric Report Block

3.1. Report Block Structure

```
 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=NBGD     |I|   resv.     |        block length = 2       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                        SSRC of Source                         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                   number of packets discarded                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
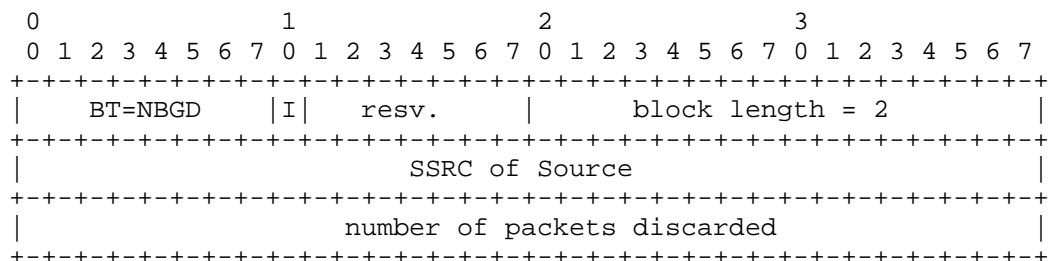
Figure 1: Report Block Structure

3.2. Definition of Fields in Discard Metric Report Block

   Block type (BT): 8 bits

      A Discard Metric Report Block is identified by the constant ND.

      [Note to RFC Editor: please replace ND 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 Packet Delay Variation
      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).

   Reserved (resv): 7 bits

      These bits are reserved. They SHOULD be set to zero by senders
      and MUST 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 2.

SSRC of source: 32 bits

   As defined in Section 4.1 of [RFC3611].

number of packets discarded: 32 bits

   Number of packets discarded over the period (Interval or
   Cumulative) covered by this report.

   If the measured value exceeds 0xFFFFFFFD, the value 0xFFFFFFFE
   SHOULD be reported to indicate an over-range measurement. If the
   measurement is unavailable, the value 0xFFFFFFFF SHOULD be
   reported.

   Note that the number of packets expected in the period covered by
   the metric (whether interval or cumulative) is available from the
   difference between a pair of extended sequence numbers in the
   Measurement Identity block, so need not be repeated in this block.

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-pd-block

    xr-pd-block = "pkt-dscrd"

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 ND in the IANA "RTCP XR
   Block Type Registry" to the "Discard Metrics Block".

   [Note to RFC Editor: please replace ND 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 "pkt-dscrd" in the "RTCP
   XR SDP Parameters Registry".

5.3. Contact information for registrations

   The contact information for the registrations is:

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   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. Contributors

   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
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8. Changes from previous version

   Changed BNF for SDP following Christian Groves' and Tom Taylor's
   comments (4th and 5th May 2009), now aligned with RFC 5234 section
   3.3 "Incremental Alternatives".

   Updated references.

9. References

9.1. Normative References

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9.2. Informative References

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   [MONARCH] Wu, Q., "Monitoring Architectures for RTP",
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   [PMOLFRAME]
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   [POSTREPAIRLOSS]
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              Correction", RFC 5109, July 2006.

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