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RTCP XR Report Block for Discard metric Reporting
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Internet-Draft

RTCP XR Discard

May 2009

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.

Table of Contents

- [1. Introduction](#) [3](#)
- [1.1. Discard Report Block](#) [3](#)
- [1.2. RTCP and RTCP XR Reports](#) [3](#)
- [1.3. Performance Metrics Framework](#) [3](#)
- [1.4. Applicability](#) [4](#)
- [2. Definitions](#) [5](#)
- [3. Discard Metric Report Block](#) [6](#)
- [3.1. Report Block Structure](#) [6](#)
- [3.2. Definition of Fields in Discard Metric Report Block](#) [6](#)
- [4. SDP Signaling](#) [8](#)
- [5. IANA Considerations](#) [9](#)
- [5.1. New RTCP XR Block Type value](#) [9](#)
- [5.2. New RTCP XR SDP Parameter](#) [9](#)
- [5.3. Contact information for registrations](#) [9](#)
- [6. Security Considerations](#) [10](#)
- [7. Contributors](#) [11](#)
- [8. Changes from previous version](#) [12](#)
- [9. References](#) [13](#)
- [9.1. Normative References](#) [13](#)
- [9.2. Informative References](#) [13](#)
- [Authors' Addresses](#) [14](#)

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).

Instances of this Metrics Block refer by tag to the separate auxiliary Measurement Identity block [\[MEASIDENT\]](#) which contains information such as the SSRC of the measured stream, and RTP sequence numbers and time intervals indicating the span of the report.

The Measurement Identity block provides extended sequence numbers for the beginning and end of both Interval and Cumulative reporting periods. This allows systems receiving the report to calculate the number of packets expected.

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](#)].

Hunt & Clark

Expires November 16, 2009

[Page 3]

Internet-Draft

RTCP XR Discard

May 2009

1.4. Applicability

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

[2.](#) Definitions

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.

For Voice-over-IP applications of the metric, if Voice Activity Detection is used then the proportion of packets lost and discarded shall be determined based on transmitted packets, i.e.

packets that contained silence and were not transmitted shall not be considered, because they do not form part of the RTP sequence.

[3.](#) Discard Metric Report Block

[3.1.](#) Report Block Structure

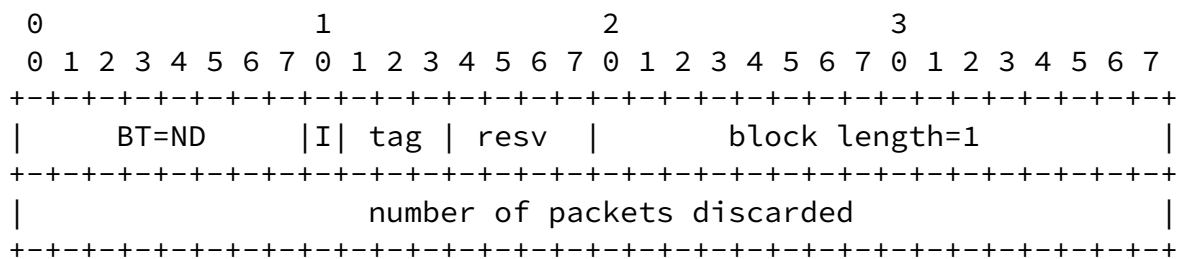


Figure 1: Report Block Structure

[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 Discard metric is an Interval or a Cumulative metric, that is, whether the reported value applies 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](#)] which describes this measurement. The relevant Measurement Identifier block has the same tag value as the Discard Metric block. Note that there may be more than one Measurement Identifier block per RTCP packet.

Reserved (resv): 4 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 Discard Metric block, the block length is equal to 1.

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 0xFFFFFFFF, the value 0xFFFFFFFF 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.

[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 "Concealed Seconds 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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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 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. 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".

Update references

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Hunt & Clark

Expires November 16, 2009

[Page 13]

Internet-Draft

RTCP XR Discard

May 2009

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