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RTCP XR Report Block for Discard Count 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.

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Table of Contents

1.	Introduction	3
1.1.	Discard Count Report Block	3
1.2.	RTCP and RTCP XR Reports	3
1.3.	Performance Metrics Framework	3
1.4.	Applicability	3
2.	Terminology	5
2.1.	Standards Language	5
3.	Discard Count Metric Report Block	6
3.1.	Report Block Structure	6
3.2.	Definition of Fields in Discard Count Metric Report Block	6
4.	SDP Signaling	9
5.	IANA Considerations	10
5.1.	New RTCP XR Block Type value	10
5.2.	New RTCP XR SDP Parameter	10
5.3.	Contact information for registrations	10
6.	Security Considerations	11
7.	Contributors	12
8.	Acknowledgments	13
9.	References	14
9.1.	Normative References	14
9.2.	Informative References	14
	Authors' Addresses	15

1. Introduction

1.1. Discard Count Report Block

This document 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 [\[MONARCH\]](#).

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 document defines a new Extended Report block. The use of Extended Report blocks is defined by [\[RFC3611\]](#).

1.3. Performance Metrics Framework

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

1.4. Applicability

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

In case of Discard count metric block sent together with Burst gap discard metric block defined in [\[BGDISCARD\]](#) to the media sender or RTP based network management system, information carried in the discard count metric block and Burst gap discard metric block allows them calculate the some bust gap summary statistics,e.g., gap discard rate.

In case of replication being kept "on", reporting duplicate packets discards allows the media sender or network management system determine what proportion of lost packets are being concealed by the process and calculate the actual loss rate which is helpful to know that there are some network issues that need to be investigated.

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 or thrown away before playout due to packet duplication or redundancy shall be regarded as discarded. A packet shall be classified as one of received (or OK), discarded or lost. The Discard Count 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 [[RFC5725](#)] is available to report on packets which are not recovered by any repair techniques which may be in use.

3. Discard Count Metric Report Block

3.1. Report Block Structure

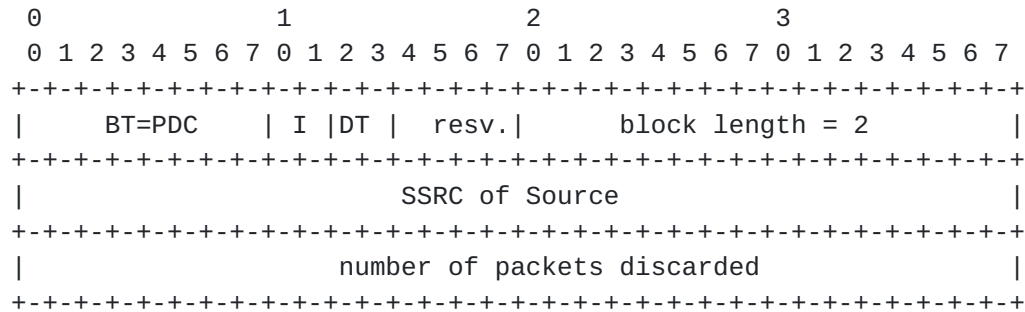


Figure 1: Report Block Structure

3.2. Definition of Fields in Discard Count Metric Report Block

Block type (BT): 8 bits

A Discard Count Metric Report Block is identified by the constant PDC.

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

Interval Metric flag (I): 2 bits

This field is used to indicate whether the Discard Count Metric is an Interval or Cumulative metric, Sample metric [[MONARCH](#)], 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 is a sampled instantaneous value (I=01) (Sampled Value). In this document, Discard Count Metric is not measured at a particular time instant but over one or several reporting intervals. Therefore Discard Count Metric MUST not be chosen as Sampled Metric.

Discard Type (DT): 2bits

This field is used to identify the discard type used in this report block. The discard type is defined as follows:

00: Report packet discarded or being thrown away before playout due to packets duplication.

01: Report packet discarded due to too early to be played out.

10: Report packet discarded due to too late to be played out.

11: Report the total number of discarded packets due to both early and late to be played out.

An endpoint MAY report only one of the above four discard types blocks in an compound RTCP report in a reporting interval. It MAY also report a combination of discard types in a compound RTCP report but not all combinations are valid. The endpoint MAY report duplicate packet discard (DT=0) block with any other discard (DT=1, 2, or 3) block. Additionally, an endpoint MUST NOT report combined discard (DT=3) block with early discard (DT=1) or late discard (DT=2) report block.

Note that duplicating RTP packets is for robustness or error resilience but disrupts RTCP statistics. In order to tackle this, the mechanism described in [\[RTPDUP\]](#) can be used which will not cause breakage of RTP streams or RTCP rules.

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 Count 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 0xFFFFFFFF, the value 0xFFFFFFFF

MUST be reported to indicate an over-range measurement. If the measurement is unavailable, the value 0xFFFFFFFF MUST be reported.

Note that the number of packets expected in the period associated with this metric (whether interval or cumulative) is available from the difference between a pair of extended sequence numbers in the Measurement Information block [[MEASI](#)], 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-pdc-block

xr-pdc-block = "pkt-dscrd-count"

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

[Note to RFC Editor: please replace PDC 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 following contact information is provided for all registrations in this document:

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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

Geoff Hunt wrote the initial draft of this document.

8. Acknowledgments

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