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# RTP Control Protocol (RTCP) Extended Report (XR) Block for TS Decodability Statistics Metric reporting draft-ietf-xrblock-rtcp-xr-decodability-01

## Abstract

Transport Stream (TS) is a standard container format used in the transmission and storage of multimedia data. Unicast/Multicast/Broadcast MPEG-TS over RTP is widely deployed in IPTV systems. This document defines an RTP Control Protocol (RTCP) Extended Report (XR) Block that allows the reporting of decodability statistics metrics related to transmissions of MPEG-TS over RTP.

## 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 April 21, 2013.

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## 1. Introduction

The European Telecommunications Standards Institute (ETSI) has defined a set of syntax and information consistency tests and corresponding indicators [ETSI] that are recommended for the monitoring of MPEG-2 Transport Streams [ISO-IEC.13818-1.2007]. The tests and corresponding indicators are grouped according to priority:

- First priority - Necessary for de-codability (basic monitoring)
- Second priority - Recommended for continuous or periodic monitoring
- Third priority - Recommended for application-dependant monitoring

This draft is based on information consistency tests and resulting indicators defined by ETSI [ETSI] and defines a new block type to augment those defined in Freidman, et al. [RFC3611] for use with Transport Stream (TS) [ISO-IEC.13818-1.2007]. The new block type supports reporting of the number of occurances of each indicator in the first and second priorities; third priority indicators are not supported. This new block type can be useful for measuring content stream or TS quality by checking TS header information [ETSI] and identifying the existence, and characterizing the severity, of bitstream packetization problems which may affect users' perception of a service delivered over RTP; it may also be useful for verifying the continued correct operation of an existing management system.

The new report block is in compliance with the monitoring architecture specified in Wu, et al. [MONARCH] and the Performance Metrics Framework [RFC6390]. The metric is applicable to any type of RTP application that uses the TS standard format for multimedia data; for example, MPEG4 TS content over RTP.

## 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. TR 101 290 Decodability Statistics Metric Report Block

This block reports decodability statistics metrics beyond the information carried in the standard RTCP packet format. It defines eight metrics based on ETSI TR 101 290. Information is reported about basic monitoring parameters necessary to ensure that the TS can

be decoded including:

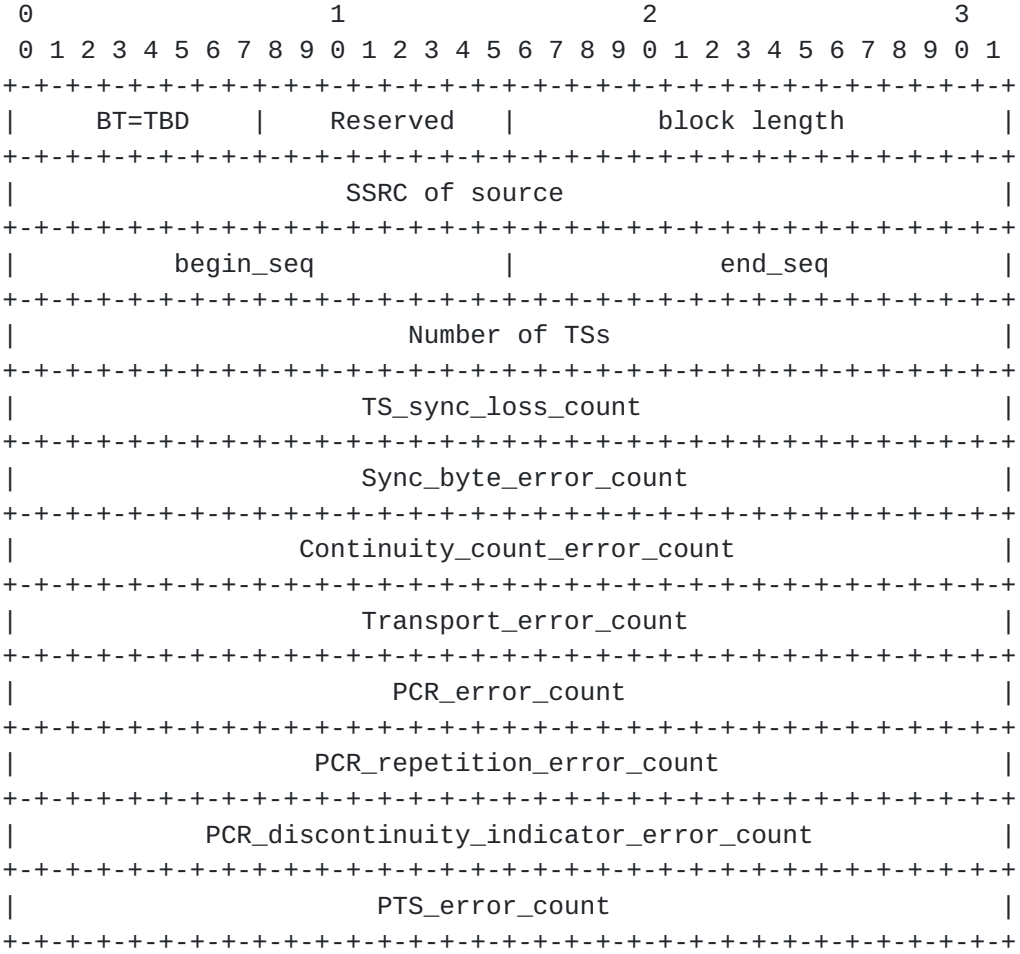
- Transport Stream Synchronization Losses
- Sync byte errors
- Continuity count errors

and continuous monitoring parameters including:

- Transport errors
- Program Clock Reference (PCR) errors
- PCR repetition errors
- PCR discontinuity indicator errors
- Presentation Time Stamp (PTS) errors

The other parameters are ignored since they do not apply to all MPEG implementations. For further information on these parameters, see [ETSI].

The Decodability Metrics Block has the following format:



block type (BT): 8 bits

A TR 101 290 decodability metrics report block is identified by the constant <TDM>.

Reserved: 8 bits

This field is reserved for future definition. In the absence of such a definition, the bits in this field MUST be set to zero and SHOULD be ignored by the receiver.

block length: 16 bits

The constant 11, in accordance with the definition of this field in Section 3 of RFC 3611.

SSRC of source: 32 bits

As defined in Section 4.1 of RFC 3611.

begin_seq: 16 bits

As defined in Section 4.1 of RFC 3611.

end_seq: 16 bits

As defined in Section 4.1 of RFC 3611.

Number of TSs: 32 bits

Number of TS in the above sequence number interval.

TS_sync_loss_count: 32 bits

Number of TS_sync_loss errors in the above sequence number interval.

Sync_byte_error_count: 32 bits

Number of sync_byte_errors in the above sequence number interval.

Continuity_count_error_count: 32 bits

Number of Continuity_count_errors in the above sequence number interval.

Transport_error_count: 32 bits

Number of Transport_errors in the above sequence number interval.

PCR_error_count: 32 bits

Number of PCR_errors in the above sequence number interval.

PCR_repetition_error_count: 32 bits

Number of PCR_repetition_errors in the above sequence number interval.

PCR_discontinuity_indicator_error_count: 32 bits

Number of PCR_discontinuity_indicator_errors in the above sequence number interval.

PTS_error_count: 32 bits

Number of PTS_errors in the above sequence number interval.

## 4. SDP Signaling

RFC 3611 defines the use of SDP (Session Description Protocol) [RFC4566] for signaling the use of RTCP XR blocks. XR blocks MAY be used without prior signaling.

### 4.1. SDP rtcp-xr-attrib Atrribute Extension

This session augments the SDP attribute "rtcp-xr" defined in Section 5.1 of RFC 3611 by providing an additional value of "xr-format" to signal the use of the report block defined in this document.

xr-format =/ decodability-metrics

decodability-metrics = "decodability-metrics"

### 4.2. Offer/Answer Usage

When SDP is used in offer-answer context, the SDP Offer/Answer usage defined in RFC 3611 applies.

## 5. IANA Considerations

New report block types for RTCP XR are subject to IANA registration. For general guidelines on IANA allocations for RTCP XR, refer to Section 6.2 ofRFC 3611.

This document assigns one new block type value in the RTCP XR Block Type Registry:

Name: TDM
Long Name: TR 101 290 Decodability Metrics
Value <TDM>
Reference: Section 3

This document also registers one SDP [RFC4566] parameters for the "rtcp-xr" attribute in the RTCP XR SDP Parameter Registry:

* "decodability-metrics"

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## 6. Security Considerations

This proposed RTCP XR report block introduces no new security considerations beyond those described in RFC 3611.

## 7. Acknowledgements

Thanks to Ray van Brandenburg for useful review and suggestions.

## 8. References

### 8.1. Normative References

[ETSI] ETSI, "Digital Video Broadcasting (DVB); Measurement guidelines for DVB systems", Technical Report TR 101 290, 2001.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC3611] Friedman, T., Caceres, R., and A. Clark, "RTP Control Protocol Extended Reports (RTCP XR)", RFC 3611, November 2003.

[RFC4566] Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol", RFC 4566, July 2006.

## 8.2. Informative References

[ISO-IEC.13818-1.2007] International Organization for Standardization, "Information technology - Generic coding of moving pictures and associated audio information: Systems", ISO International Standard 13818-1, October 2007.

[MONARCH] Wu, Q., Hunt, G., and P. , "Monitoring Architectures for RTP", ID draft-ietf-avtcore-monarch-22, September 2012.

[RFC6390] Clark, A. and B. Claise, "Guidelines for Considering New Performance Metric Development", BCP 170, RFC 6390, October 2011.

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