

Advertisement for multi-source endpoint multiplexing multiple media type
in the same RTP session
[draft-wu-avtcore-multisrc-endpoint-adver-02.txt](#)

Abstract

When two endpoints with multiple media sources are in communication, each media source or each receiver within either endpoint may send or receive reception report independently. This may incur a lot of duplicated reception report to and from the endpoint with multiple sources. This document discusses how to tackle these problems and propose three phases for suppressing reception reports.

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1. Introduction

For some applications that use unicast transport, e.g., in RTCWeb application, an endpoint with multiple media sources (i.e., multiple-source hosts, e.g., a client with several cameras) may use a different SSRC for each medium but sending them in the same RTP session, which reduces communication failure due to NAT and firewall when using multiple RTP sessions or transport flows.

However when two endpoints with multiple media sources are in communication, each media source within either endpoint may send reception report independently and the receiving endpoint may not know the reception reports received from different media source are from the same sending endpoint. This creates the following three problems:

- o An endpoint with multiple media sources involved in one RTP session may send the reception report with duplicated information about the same remote media source from each of local media sources.
- o An endpoint with multiple media sources involved in one RTP session may receive the reception report with duplicated information about the same local media source from each of remote media sources.
- o An endpoint with multiple media sources involved in one RTP session also may send reception reports about one of its own media sources from another of its own (This is also referred to as RTCP self-reporting). Such reception reports cause additional redundant traffic travelling over the link between sending endpoints and receiving endpoint, which changes the report interval and may affect the media qualities.

This document discusses how to tackle these problems. Three phases for suppressing reception reports are proposed.

- o Grouping of media sources originate from a single endpoint and classifying these media sources into multiple groups.
- o Electing one single SSRC for reception report sending and one single SSRC for reception report monitoring based on local policy.
- o Advertising the SSRC that is used either for reception report sending or reception report monitoring.

[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.](#) Protocol Overview

In order to suppress unnecessary reception reports to and from multi-source endpoint, multi-source endpoint should group media sources originating from a single endpoint and elect one or a set of specified SSRCs for reception report processing (e.g., reception report sending, reception report receiving and reception report monitoring).

[3.1.](#) Report Source Grouping

When an endpoint with multiple sources multiplexes multiple media types in the same RTP session, the media source originating from the same endpoint should be grouped together. Similarly the endpoint with multiple sources may have multiple one or more than one report source for monitoring. These report sources for monitoring should also be grouped together. Therefore an endpoint with multiple sources should at least split all its own media sources or receivers into two groups(i.e., split SSRCs into two groups): One is sending group, the other is monitoring group. Each group may have one or several group members. Each group member is identified by a different SSRC.

[3.2.](#) Report Source Election

When grouping for each endpoint with multiple sources is available, in order to prevent group members receiving duplicated data, one or more than one group member MUST be elected from sending group as report source for reception report sending. When one report source leaves the session or is down, another candidate report source can replace instead. If the monitoring is used, each endpoint with multiple sources MUST have at least one report source for monitoring purpose. One or more than one reporting sources MUST be selected from monitoring group for monitoring use.

Each endpoint with multiple sources at least has one SSRC for reception report sending. If the monitoring is used, the endpoint with multiple sources should choose another SSRC from monitoring group as monitoring report source.

[3.3.](#) Report Source Advertisement

When report sources are elected for reception report sending, and monitoring purpose respectively, it is necessary to signal which report source is used for which purpose.

In this document we define two new SDP items to advertise the reporting sources from endpoint with multiple sources that are used

for reception report sending and monitoring respectively (See [section 5.1](#) and [section 5.2](#) for protocol format details).

When those report sources are advertised, the selected report source can send reception report about the same remote media source on behalf of the media sources of its own, which prevent duplicated reception report sent from all the local media sources of its own for the same event.

If the other media source which is not selected as report source knows or understands the advertised report source, it should suppress the reception report for the same event.

If the other media source which is not selected as report source does not know or understand the advertised report source and detects the need to send reception report, this media source should wait for a (short) random dithering interval to check whether it sees a corresponding reception report message from any other receiver or other media sources of its own reporting the same event. If a corresponding reception report for the same event is received from other media sources or any other receivers, it should refrain from sending the reception report message.

In order to prevent duplicated reception report sent from one of its own media sources to another of its own within the same endpoint with multiple sources(i.e., self-reporting), the report source should know the other media sources of its own and suppress sending the reception report on the remote source to its own media sources.

Editor's note: Current draft does not discuss topologies like source projection mixer where the mixer keeps the original ssrc so even though they arrive from the mixer they have different CNAMEs. It will be useful to discuss those topologies in the future version.

4. Protocol formats

Editor's note: It is not clear if you need to signal which one is used or what is the group but if needed it may be better to allow the sender to indicate which SSRCs are part of a group. It will also require an negotiation in the offer/answer to verify that this mode is supported by the stream senders.

4.1. SDDES item for Reception Report Sending

This sub-section defines the format of the Reception Report Sending SDDES item. The SDDES item is carried in the RTCP SDDES packet. The packet format for the RTCP SDDES is defined in [Section 6.5 of \[RFC3550\]](#). Each SDDES packet is composed of a header with fixed-length fields for version, source count, packet type (PT), and length, followed by zero or more chunks. Each chunk consists of an SSRC/CSRC identifier followed by zero or more SDDES items. If this SDDES item is carried, the CNAME SDDES item should also be carried together with this SDDES item in the same chunk. In the SDDES packet, the PT field is set to SDDES(202).

4.1.1. RRS: Reception Report Sending SDDES Item

```

      0                   1                   2                   3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   RRS=TBD   |   length   | Candidate Report Source SSRC
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   ....
+---+---+---+---+---+

```

The Reception Report Sending Item is not mandatory item and intended for indicating the elected report source for an endpoint with multiple sources, which is responsible for reception report sending. The SSRC/CSRC identifier included in the same chunk (at the beginning of this chunk) as the item is the SSRC of elected sending report source. Additionally, this item may carry one or more than one Candidate Report Source SSRCS. The candidate Report Source SSRC follows the same format as SSRC/CSRC identifier defined in [RFC3550](#). Its length is described by the length field. The value of the length field does not include the two octet SDDES item header. This item MUST be ignored by applications that are not configured to make use of it.

4.2. SDDES item for Reception Report Monitoring

This sub-section defines the format of the Reception Report Monitoring SDDES item. The SDDES item is carried in the RTCP SDDES

packet. The packet format for the RTCP SDES is defined in [Section 6.5 of \[RFC3550\]](#). Each SDES packet is composed of a header with fixed-length fields for version, source count, packet type (PT), and length, followed by zero or more chunks. Each chunk consists of an SSRC/CSRC identifier followed by zero or more SDES items. If this SDES item is carried, the CNAME SDES item should also be carried together with this SDES item in the same chunk. In the SDES packet, the PT field is set to SDES(202).

[4.2.1.](#) RRM: Reception Report Monitoring SDES Item

```

      0                   1                   2                   3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   RRM=TBD   |   length   | Candidate Report Source SSRC
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   ....
+---+---+---+---+---+

```

The Reception Report Sending Item is not mandatory item and intended for indicating the report source for an endpoint, which is responsible for reception report monitoring. The SSRC/CSRC identifier included in the same chunk as the item (at the beginning of this chunk) is the SSRC of elected sending report source. Additionally, this item may carry one or more than one Candidate Report Source SSRCs. The candidate Report Source SSRC follows the same format as SSRC/CSRC identifier defined in [RFC3550](#). Its length is described by the length field. The value of the length field does not include the two octet SDES item header. This item MUST be ignored by applications that are not configured to make use of it.

5. Security Considerations

RTCP reports can contain sensitive information, including information about report source grouping for endpoint with multiple source and member of a session established between two or more endpoints. Therefore, the use of security mechanisms with RTP, as documented in [Section 9 of \[RFC3550\]](#) applies.

[6.](#) IANA Considerations

New SDES types for RTCP SDES are subject to IANA registration. For general guidelines on IANA considerations for RTCP SDES, refer to[RFC3550].

[6.1.](#) New RTCP SDES Type values

This document assigns two additional SDES type in the IANA "RTCP SDES Item Types Registry" to the new SDES items as follow:

abbrev.	name	value
RRSS:	Reception Report Sending Source	TBD
RRRS:	Reception Report Monitoring Source	TBD

[Note to RFC Editor: please replace RRSS and RRMS with the IANA provided RTCP SDES Item Types.]

[7.](#) References

[7.1.](#) Normative References

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[7.2.](#) Informative References

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