Guidelines for Choosing RTP Control Protocol (RTCP) Canonical Names (CNAMEs)

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Abstract

The RTP Control Protocol (RTCP) Canonical Name (CNAME) is a persistent transport-level identifier for an RTP endpoint. While the Synchronization Source (SSRC) identifier of an RTP endpoint may change if a collision is detected, or when the RTP application is restarted, the CNAME is meant to stay unchanged, so that RTP endpoints can be uniquely identified and associated with their RTP media streams. For proper functionality, CNAMEs should be unique within the participants of an RTP session. However, the recommendations for choice of the RTCP CNAME provided in RFC 3550 are insufficient to achieve this uniqueness. This memo updates the guidelines in RFC 3550 to allow endpoints to choose unique CNAMEs.

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1. Introduction

In Section 6.5.1 of [RFC3550], there are a number of recommendations for choosing the RTCP CNAME for an RTP endpoint. These recommend that the CNAME is of the form "user@host" for multiuser systems, or "host" if the username is not available. The "host" part is specified to be the fully qualified domain name of the host from which the real-time data originates, or the numeric representation of the IP address of the interface from which the RTP data originates for hosts that do not have a domain name.

As noted in [RFC3550], the use of private network address space [RFC1918] can result in hosts having network addresses that are not globally unique. However, this problem is not solely with private network addresses, but may also occur with public IP addresses, where multiple hosts are assigned the same public IP address and connected to a Network Address Translation (NAT) device [I-D.miles-behave-l2nat]. When multiple hosts share the same IP address, using the IP address as the CNAME can lead to non-unique CNAMEs.

[RFC3550] also notes that if hosts with private addresses and no direct IP connectivity to the public Internet have their RTP packets forwarded to the public Internet through an RTP-level translator, they may end up having non-unique CNAMEs. [RFC3550] suggests that such applications provide a configuration option to allow the user to choose a unique CNAME, and puts the burden on the translator to translate CNAMEs from private addresses to public addresses if necessary to keep private addresses from being exposed. Experience has shown that this does not work well in practice.

For all these reasons, this memo proposes alternative algorithms for choosing CNAMEs.

2. Requirements Notation

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 [RFC2119].

3. Choice of RTCP CNAME in Private Networks

It is a difficult task for a host to determine whether it resides behind a NAT without the help of an external mechanism such as STUN [RFC5389]. Furthermore, even some public IP addresses can be shared by multiple hosts in the Internet. Thus, using the numeric
representation of the IP address as the RTCP CNAME is NOT
RECOMMENDED.

In order to meet the SHOULD requirement of Section 6.5.1 of
[RFC3550], RTP endpoints SHOULD practice one of the following
guidelines:

- Given that IPv6 addresses are naturally unique, a host MAY use its
  IPv6 address as the CNAME when using an IPv6 interface for RTP
  communication. If the RTP endpoint is associated with a unique
  local IPv6 unicast address [RFC4193], that address MAY be used as
  the CNAME as well. Using IPv6 addresses as CNAMEs was originally
  suggested in [RFC3550].

- A host that does not know its fully qualified domain name, and is
  configured with a private IP address on the interface it is using
  for RTP communication, MAY use the numeric representation of the
  layer-2 (MAC) address of the interface it is using for RTP
  communication as the "host" part of its CNAME. For IEEE 802 MAC
  addresses, such as Ethernet, the standard colon-separated
  hexadecimal format is to be used, e.g., "00:23:32:af:9b:aa".

- A host MAY use its Universally Unique IDentifier (UUID) [RFC4122]
  as the CNAME.

This memo does not mandate a specific order in which these methods
should be practiced. A specific order would be only needed if an RTP
endpoint was expected to be comprised of multiple programs that
independently needed to choose the same CNAME. Since this is not a
common implementation technique, a specific order is not needed.

4. Security Considerations

The security considerations of [RFC3550] apply to this document as
well.

5. IANA Considerations

There are no IANA considerations in this document.

6. Acknowledgments

Thanks to Dan Wing who pointed out the concerns about cases where two
hosts could share the same public IP address. Also, thanks to Marc
Petit-Huguenin who suggested to use UUIDs as CNAMEs.
7. References

7.1. Normative References


7.2. Informative References


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