ECN for RTP over UDP

draft-ietf-avt-ecn-for-rtp-03

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Outline

› Introduction

› Changes

› Issues

– Nonce

– Initiation mechanisms

– Combining ECN packets

– Registry for ICE options

› Going Forward

Introduction

› Specifying a general mechanism for how to use ECN for RTP when sent over UDP

› Needs to work for all usages of RTP

  – Unicast

  – Multicast

  – Mixer and Translators

› Solution consists of phases

  – Signaling

  – Initiation

  – Ongoing usage

  – Fault detection and recovery

› Thanks to Bob Briscoe for extensive review of -02

Changes since previous version

› Removed Nonce (more about this later)

› Clarified some terminology

› Some restructuring moving RTCP Report Extensions prior to usage description

› Changed description of when Leap of Faith is applicable

› Suggestion that implementations should log ECN path failures found

› Assigned some code-points
  – RTP/AVPF transport layer feedback packet type 6
  – RTCP XR block type 13

› Various editorial cleanups

Issue – ECN Nonce

› Support for ECN nonce was removed in -03 following email discussion around anti-cheating mechanisms raised by Bob Briscoe

› Cumbersome mechanism with low utility
  – Big Report packets
  – Not fool proof

› Relies on sender being trustworthy and honest
  – This is likely true for infrastructure devices

› A Cheater can easily avoid the ECN nonce mechanism
  – Claim to be non-ECN compliant, and lie about packet loss

› Is there consensus on removing this from base solution?
  – Nonce mechanism could be revived later as an extension (although we need to be careful to ensure the signalling is extensible to allow this)

Issue – Initiation Mechanisms

› Draft currently specifies 3 mechanisms for initiation:
  – Probing using occasional ECN-marked RTP packets, with RTCP feedback
  – Leap of Faith
  – STUN-based probing for use with ICE

› Cullen Jennings raised that he would prefer only one method.

› Probing appears to be the only generally applicable mechanism (i.e., that works in all use cases):
  – ICE not always used, and does not work in multicast
  – Leap of faith can result in failure if a middle-box drops ECN-marked packets

› Suggestion:
  – MUST implement RTCP-based probing; leap-of-faith is OPTIONAL
  – If ICE is implemented then MUST implement STUN-based probing, but MAY fall-back to RTCP-based probing if that fails

Issue – Combining ECN packets

› In Translators ECN packets can be split or joined – what happens to ECN-CE markings on such packets?

› Current solution based on TCP rules

– If a marked packet is split, all resulting packets are marked; if a marked packet is combined, the resulting packet is marked

– Bob Briscoe proposes marking based on the ratio of marked *bytes*

› "…the outgoing packet SHOULD be ECN-CE marked with a probability proportional to the ratio of ECN-CE bytes to total bytes in the incoming packets being combined. However, for simplicity, the outgoing packet MAY be ECN-CE marked if any of the incoming packets are ECN-CE marked. This latter option will inflate the amount of congestion indicated, but it is at least safe."

› Is the improved resolution in congestion volume worth the complexity?

Issue – ICE Options IANA Registry

› RFC 5245 states that an ICE options registry exists, but doesn't define it

› This draft needs to register an option into this registry!

› Solutions:

– Define the registry in this draft? (preferred)

– Submit a separate draft to MMUSIC?

Going Forward

› Known issues still to address:

- Add SDP parameter for XR and FB packets
- Clarify SDP Offer/Answer and write SDP examples
- Clarify what parts are mandatory to implement
- Improve specification modularity
- Fix SDP attribute so "ect" remains extensible
- Improve considerations how media stream directionality and ECN directionality interact
- Determine if optimization for end-points with multiple SSRCs in unicast can have quicker resolution of ECN capability

› Resolve the issues discussed today

› Aim at having next version of draft in December, hope to be ready for WG last call by IETF 80