A Bandwidth Attribute for TURN

draft-thomson-tram-turn-bandwidth-01

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Problem Statement

- TURN server relay services can be used for a number of applications, which provide services as diverse as: audio only, audio & video, and/or data channel

- Multi-tenanted and multi-application TURN servers will become common

- To protect against one user (or a group of users) from unfairly using TURN server resources (i.e. bandwidth), a TURN server can apply rate limiting policy

- How does a TURN server learn the expected bandwidth usage of a TURN client?

- How does a TURN client learn the maximum bandwidth permitted before the server rate limits?
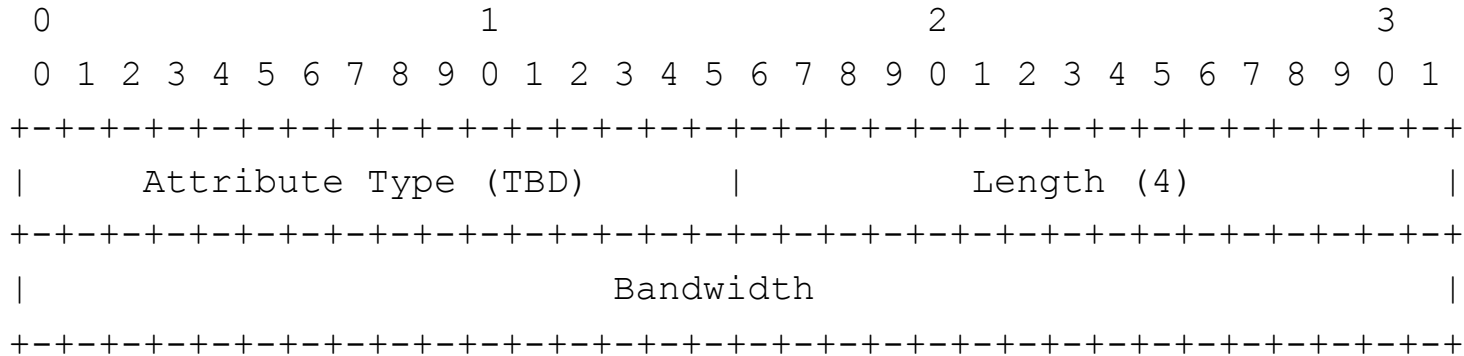
Proposed Mechanism

- A TURN client can communicate maximum expected bandwidth usage expected in an Attribute in an Allocate request to a TURN server

- A TURN server can communicate maximum bandwidth allowed (policy) for a particular relayed candidate in an Attribute in an Allocate response to a TURN client

- A TURN server can discover which application is using TURN services and apply policy based on:
  - Auth credentials
  - Origin insight (draft-ietf-tram-stun-origin)

History

- A BANDWIDTH attribute and 507 "Insufficient Bandwidth Capacity" response was originally in the TURN draft up to version draft-ietf-behave-turn-07

    – Removed as "the requirements for this feature were not clear and it was felt the feature could be easily added later."

- The use of a BANDWIDTH attribute and 507 response was proposed for ICE consent in draft-thomson-mmusic-rtcweb-bw-consent

    – This draft does not propose an ICE usage, only a TURN usage

- Other bandwidth related attributes have been proposed in draft-martinsen-tram-discuss

    – The syntax could easily be aligned if both approaches move forward

The BANDWIDTH Attribute

```
 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|        Attribute Type (TBD)       |            Length (4)     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                            Bandwidth                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- The value of this attribute is an unsigned integer that represents the maximum bandwidth for the flow in kilobits per second (1 kilobit = 1024 bits).

Usages

- ## TURN Usage

  - May be present in Allocate request or response between TURN client and server

  - Client indicates requested bandwidth

  - Server indicates max bandwidth before rate limiting may be applied

    - Client might decide to change codecs or media types or change TURN servers based in this info

- ## STUN/ICE and other Usages

  - Not recommended

Implementation Status (RFC 6982)

- A multiple realms capable advanced open source TURN server (named 'Coturn') has been created by Oleg Moskalenko and is freely licensed under the New BSD license. This reference implementation and proof-of-concept provides a clone (a spin-off) of the rfc5766-turn-server project adding STUN BANDWIDTH attribute support, among other TRAM Working Group STUN and TURN extensions.

Next Steps

- Interest in solving this problem?