RTP Subsessions

draft-ejzak-avtcore-rtp-subsessions-02

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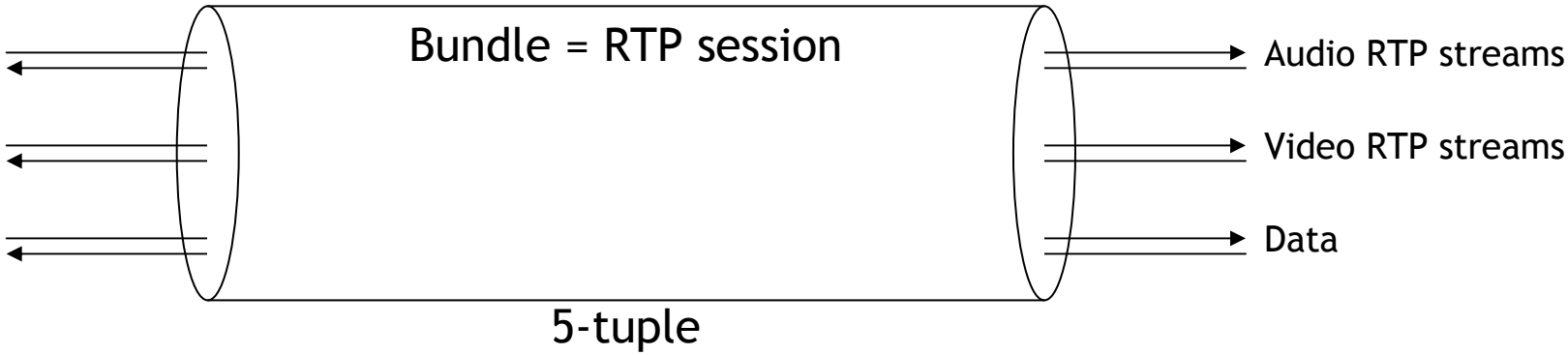
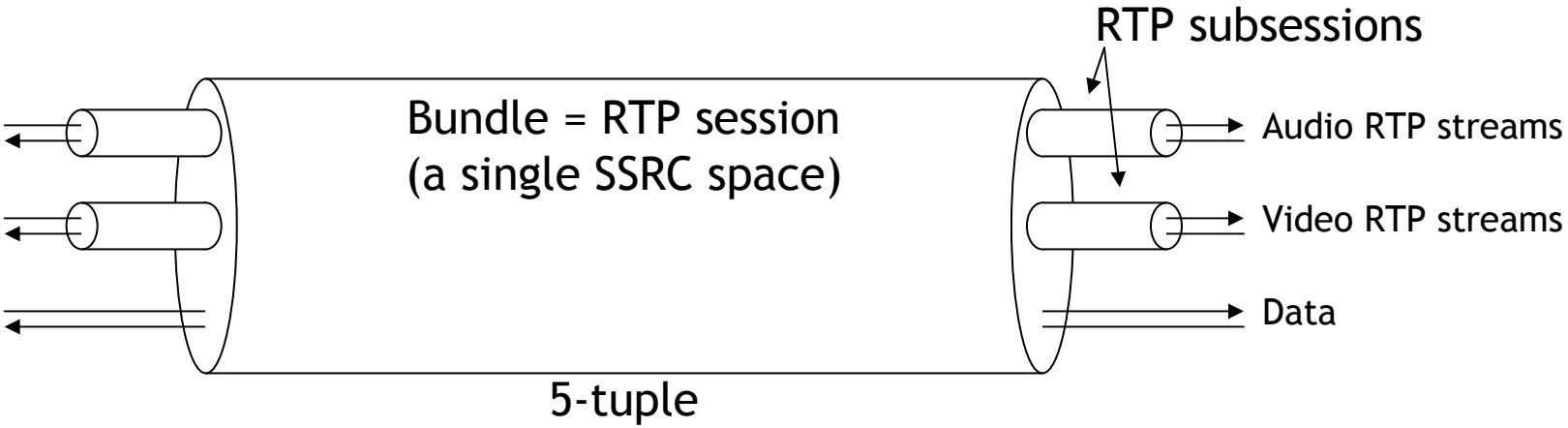
Problem



- Bundled media likely to receive the same QoS treatment
- Packet markings are changed/ignored by most networks in at least one direction
- Network needs to identify flows based on info in packet above IP layer (DPI) to provide differential treatment
- Highly desirable to support diff. treatment for bundled flows to retain advantages of bundle

A Solution



- Pre-allocate SSRC values for each RTP stream
- Group the RTP streams from each m-line into an RTP subsession
- Only concatenate together RTCP packets associated with the streams in an RTP subsession

Relationship to MSID

- Rtcweb reserves an SSRC value for each RTP stream
- Currently there is no provision for dealing with SSRC collisions with MSID
- This SSRC reservation mechanism is consistent with RTP subsessions

Options & alternatives

Options:

1. Use MSID to allocate SSRC values
   - No signaling extensions needed
   - QoS filters defined by SSRC values
     e.g., filter=5-tuple+(SSRC1 or SSRC2 …)
   - RTCP packets segregated by m-line (only Δ needed)
   - Application can override SSRC values to simplify filters
2. Assign SSRC prefix for each m-line [proposal in draft]
   - Requires SDP extensions to signal SSRC prefix
   - Better supports muxing within an m-line (simplifies filter)
   - RTCP packets segregated by m-line

Alternatives:

1. SHIM
   - Requires changes to RTP framing (potential middlebox impact)
   - QoS filters include SHIM header
2. RTP extension header
   - Position of extension header may vary (after CSRCs)
   - Adds at least 8 octets

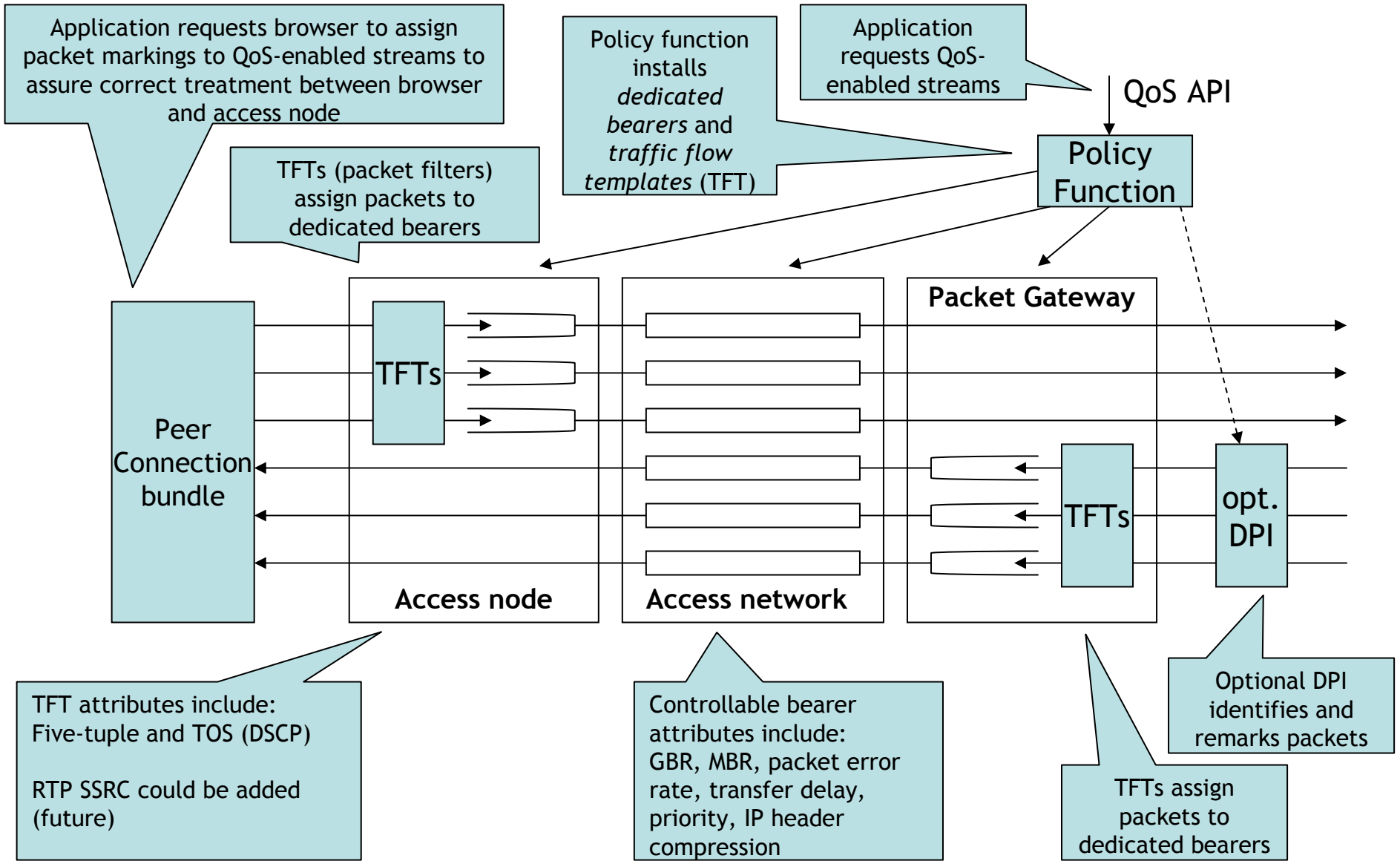
Next steps?

Backup

Assumptions

- Focus on QoS in access network
  - Access network the most critical portion of end-to-end path for many use cases
    - E.g., wireless
- Consistent with marking-based QoS
- No dependence on markings received from network
- Application is able to request access network QoS
- Application is able to select markings assigned to media streams if necessary to ensure that –
- Packets with different markings are handled by independent queues on path between browser and access node (e.g., wireless device or modem)
  - Assumption consistent with architecture of many mobile devices (e.g., smartphones)
  - Problematic in many existing home networks but this is a problem that needs to be solved anyway

Simplified LTE QoS example



SSRC prefix option

- RTP subsessions:
  - Each bundled m-line is allocated an RTP subsession
  - Pre-allocate range of SSRC values for use by each RTP subsession endpoint
  - Use SDP attribute to specify SSRC prefix per m-line
  - 128 subsessions can share the same 5-tuple
  - Network uses SSRC prefix in TFT to identify packets for QoS treatment
  - No change to RTP or RTCP message formats
  - Reuse RTP session procedures on each RTP subsession
    - In particular, only RTCP packets from a single RTP subsession are concatenated
  - SSRC reservation avoids collisions
    - More consistent with features that need to identify the contents of individual RTP streams by reserving SSRCs (proposed in both rtcweb and clue)
  - Fully consistent with non-relay topologies (independent SSRC assignment per link in end systems and RTP mixers)
  - Relay (translator) topologies supported between all systems supporting RTP subsessions
    - Legacy interworking provided via SSRC mapping (RTP mixer)