RTP over DCCP
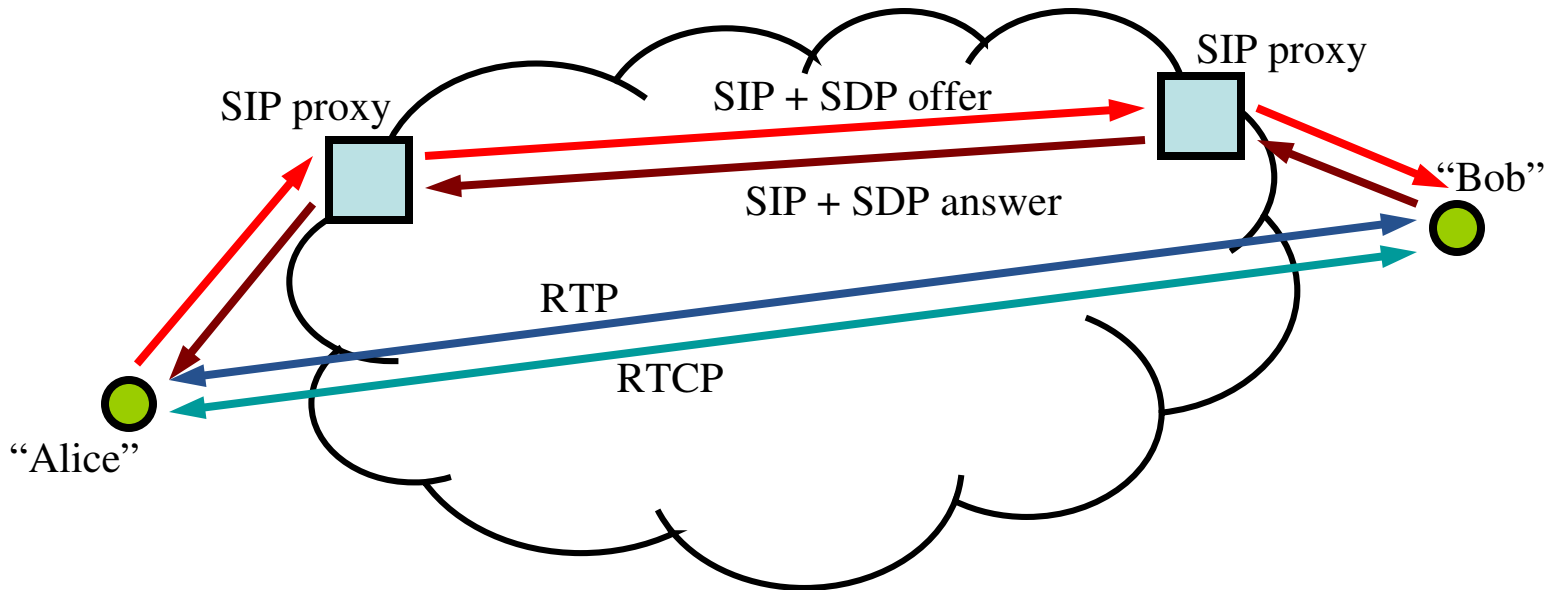
Colin Perkins

draft-perkins-dccp-rtp-00.txt

RTP, SIP and SDP

- Initial application level signalling using SIP + SDP
  - Negotiate transport addresses, port, media formats, etc.
- Followed by RTP data
  - RTP media flows
  - RTP Control Protocol (RTCP)
    - Low rate reception quality statistics and lip-sync information

SDP Signalling

- Application-level connection establishment & feature negotiation in conjunction with SIP using offer/answer model

```
v=0                                          Offer
o=alice 1129377363 1 IN IP4 10.0.0.47
s=-
c=IN IP4 10.0.0.47
t=0 0
m=video 51372 DCCP/RTP/AVP 99
a=rtpmap:99 h261/90000
a=dccp-service-code:52545020
a=setup:passive
a=connection:new
```
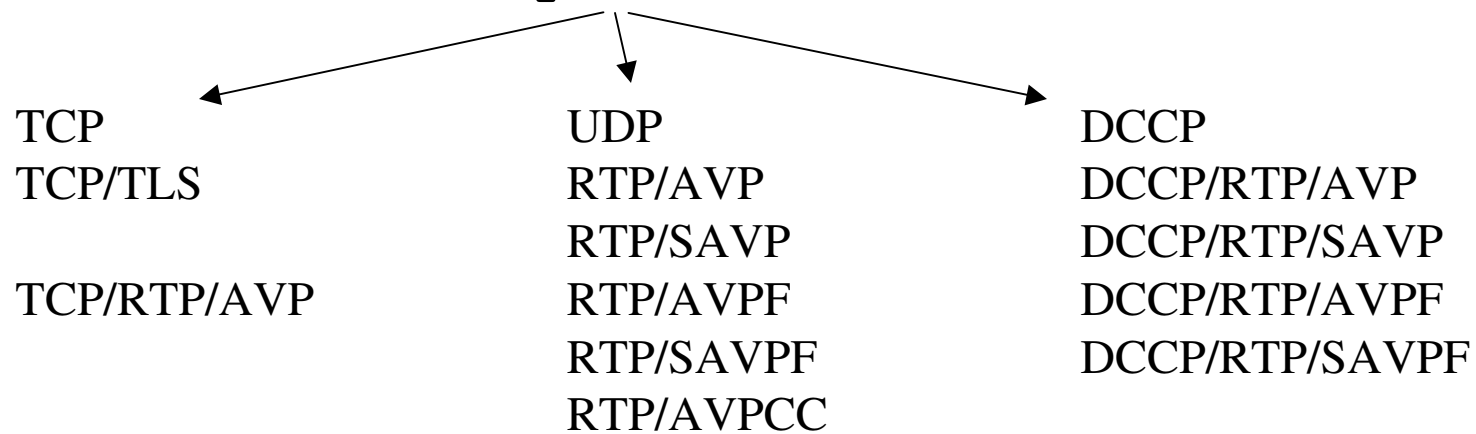
SDP Signalling

- Application-level connection establishment & feature negotiation in conjunction with SIP using offer/answer model

```
v=0
o=bob 1129377364 1 IN IP4 10.2.5.128
s=-
c=IN IP4 10.2.5.128
t=0 0
m=video 9 DCCP/RTP/AVP 99
a=rtpmap:99 h261/90000
a=dccp-service-code:52545020
a=setup:active
```

Answer

Protocol Identification

```
media-field = "m=" media SP port ["/" integer]
              SP proto 1*(SP fmt) CRLF
```

TCP	UDP	DCCP
TCP/TLS	RTP/AVP	DCCP/RTP/AVP
	RTP/SAVP	DCCP/RTP/SAVP
TCP/RTP/AVP	RTP/AVPF	DCCP/RTP/AVPF
	RTP/SAVPF	DCCP/RTP/SAVPF
	RTP/AVPCC	

- Proliferation of **proto** values unfortunate, but unavoidable
  - SIP folks will hate this, SDP limitation

- The **fmt** is either a MIME type or an RTP payload type

Service Codes

```
dccp-service-attr =
              "a=dccp-service-code:" 1x8HEXDIG
```

- Conveys numeric value of DCCP service code in network byte order

- How to assign service codes?
    - Per RTP profile?
    - Per application?

- Propose: per-application, since application requirements vary
    - Allows use of common DCCP port for all RTP applications

Connection Management

```
setup-attr = "a=setup:" role
role = "active"/"passive"/"actpass"/"holdconn"

connection-attr = "a=connection:" conn-value
conn-value = "new"/"existing"
```

- Usual SDP connection management; nothing DCCP specific

- When using **a=setup:active** SHOULD specify port 9 (the "discard" port)
    - Not currently registered for DCCP
    - No IANA considerations for assigning DCCP ports
        - Need a new draft?

Framing RTP

- One RTP packet $\Rightarrow$ one DCCP packet

- Keep DCCP connection open for duration of RTP session
- Send periodic zero-length DCCP-Data packet as NAT keep-alive
    - Removes need for RTP No-op
    - Do we need define NAT traversal for DCCP?
        - Might need a STUN for DCCP draft

- Partial checksums MAY be used

- MUST use congestion control
    - Note impact on applications
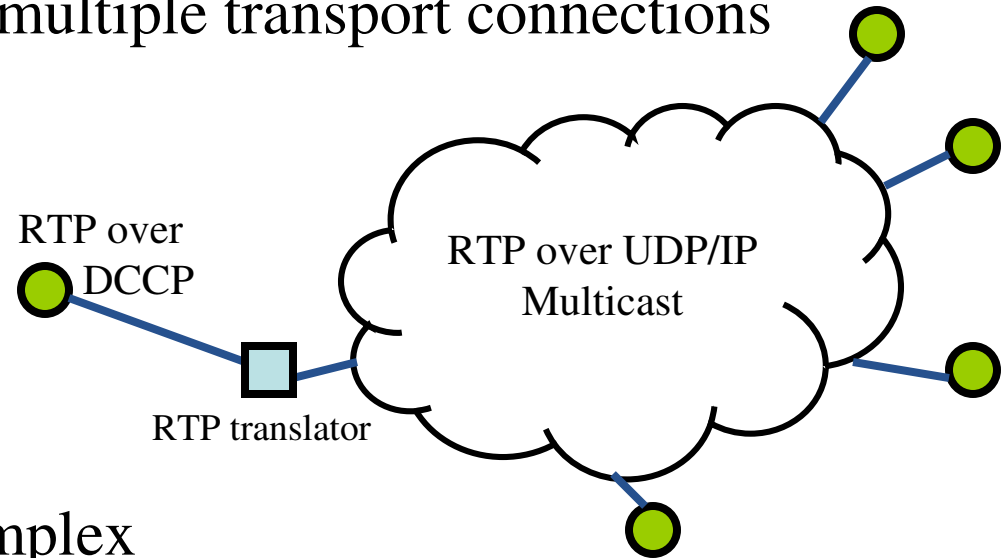   - No explicit guidance

Framing RTCP

- RTCP SHOULD be used in usual manner
- One compound RTCP packet $\Rightarrow$ one DCCP packet

- RTCP timing rules apply, but congestion control takes precedence
  - Unlikely to be an issue, since RTCP typically one packet every 5 seconds
  - RTP/AVPF may affect this

- Is RTP "session bandwidth" affected by congestion control?
  - How does this affect RTCP reporting interval?
  - Potential for inconsistent intervals?

- No real overlap between RTCP and DCCP feedback
  - Except RTCP XR loss RLE

Multiplexing Data and Control

- Obvious mapping: two DCCP connections; one RTP, one RTCP
- But:
  - Large gateways frequently run out of UDP ports
  - Multiple ports complicates firewall/NAT traversal

- Multiplex RTP and RTCP onto a single DCCP connection?
  - Can use RTP Payload Type field to de-multiplex, with careful assignment

- Propose: require multiplexing
  - Give guidance on payload type assignment; translators to RTP over UDP

RTP Sessions and DCCP Connections

- An RTP session can span multiple transport connections
    - Translators
    - Mixers

RTP over
DCCP

RTP over UDP/IP
Multicast

RTP translator

- Mixers and translators complex
    - Different congestion control policies in each domain
    - Will likely need transcoding; layered coding

- Propose: document the issues, but don't give explicit guidance
    - Don't have the experience to give guidance

Other Questions or Comments?

Accept as DCCP work item?