DataChannel SDP
IETF flavor

Let's make some decisions!

IETF Interim 2/2013

Based on draft-ietf-mmusic-sctp-sdp-03

- SCTP SDP allows multiple protocols on a DTLS connection on different pseudo-ports
  - Limited form of recursive SDP
- Use in WebRTC DataChannels :

```
m=application 54111 DTLS/SCTP 5000 5001 5002
c=IN IP4 79.97.215.79
a=sctpmap:5000 webrtc-datachannel 16
a=sctpmap:5001 bfcp 2
a=sctpmap:5002 t38 1
```

Issues with SCTP SDP draft

- Implies an “a=protocol-name” for each protocol, which I want to change (a=webrtc-datachannel, a=bfcp, etc)
  - Example from draft:
    - `a=webrtc-DataChannel:5000 stream=1;label="channel 1";subprotocol="chat";`
- I'd strongly prefer a single attribute ala fmtp, but allowed to be repeated:
  - a=sctp-protocol:<fmt> <protocol-specific-args>
  - Example:
    - `a=sctp-protocol:5000 stream=1;label="channel 1";subprotocol="chat";`
  - This would avoid adding an arbitrary number of a= attributes

Changes to API

- Coming out of IETF 85, there was consensus to add a 'protocol' field (used to mirror 'protocol' in WebSockets):

  channel = pc.createDataChannel(“name”,”protocol”,options);

- At the protocol level, an extra string gets added to the Open message
- Points out some simple versioning is needed on the Open messages

Proposal

- Option 2a from my email to the W3 list: http://www.w3.org/mid/5048AE91.5090301@jesup.org
  - No DataChannel connection unless you call pc.createDataChannel()
    - If you call before CreateOffer(), adds an m= line for DataChannel
    - If called later, triggers a negotiation event (and m= line)
    - Note: negotiation only happens when first channel(s) are added; createDataChannel after already connected does not cause renegotiation.

Signaling of channels in initial SDP

- Initial offering of an m= line for DataChannels should include SDP specifying the channels to open initially
  - Calling createDataChannel before createAnswer adds channels to the answer SDP
  - When the Answer is generated and installed, the DataChannel connection is started, and when it connects, an OnConnection event is sent, and for each DataChannel in the SDP the onDataChannel callback is invoked on the appropriate side
  - Calls to createDataChannel after createOffer/createAnswer and before onConnection are queued and execute when onConnection occurs.
  - Renegotiation with an already-negotiated m= line for DataChannel does not include any individual DataChannel definitions.

Issues with the draft

- Adds an undefined a=webrtc-Datachannel
  - Easily resolved, though I'd prefer something more generic and reusable in other protocols (a=sctp-protocol)
- Fair bit of work to avoid queuing the DataChannel creates
- No way to reject an individual channel
  - But you can't after the connection is open either, so we shouldn't care. You can .close() it after it's created, or not set onDataChannel.

Alternative

- Option 2b:
  - All channels created queue until OnConnection
  - SDP only specifies m=application …
- Pros
  - Simple, faster to implement
- Cons
  - Adds 1.5 RTT plus a bit to DataChannel setup time
    - Do we care? Stockholm Interim comments indicated we do (Martin, others)
    - Especially important for DataChannel-only PeerConnections

Examples

Offer:

```
m=application 54111 DTLS/SCTP 5000
a=sctpmap:5000 webrtc-DataChannel 16
a=sctp-protocol:5000 stream=1;label="channel 1";subprotocol="chat";
a=sctp-protocol:5000 stream=2;label="channel 2";
                              subprotocol="file transfer";max_retr=3
```

Answer:

```
m=application 34543 DTLS/SCTP 5000
a=sctpmap:5000 webrtc-DataChannel 16
a=sctp-protocol:5000 stream=3;label="channel 3";subprotocol="game";
```

Decisions!

- 2a or 2b, that is the question
  - We need to decide!
- SDP approach in the current draft:
  - Multiple protocols can run over one DTLS connection
  - Adds a=sctpmap
  - Adds an a=webrtc-datachannel attribute; I'd like to change that to a=sctp-protocol
- Alternative would be a single protocol with <fmt> values used to specify individual DataChannels via ftmp; only adds a=sctpmap
  - m=application 3456 SCTP/DTLS 1 2 3 4
  - a=sctpmap webrtc-datachannels streams=16
  - a=fmtp:1 stream=3;label="channel 3";subprotocol="game";
  - ...