The WebRTC APIs

Presentation to W3C TAG
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Goals of the WebRTC project

- Make the browser an interactive media platform
- Make interactive video and audio (and data) available to all applications developers
- Do so in a manner that respects privacy and provides adequate security

Main WebRTC concepts

- Source: Local media
  - Camera, microphone, screencast, file content….
  - Protected by permission requests - privacy!
- MediaStreamTrack: API surface for media engine
- MediaStream: Group of MediaStreamTrack
  - Fits with <video> source concept
  - Implies synchronization
- PeerConnection: Network access
  - Sends MediaStreams over the wire

Original design courtesy of Ian Hickson

Network Layers - IETF cooperation

- Secure RTP, DTLS, SCTP, DTLS-SRTP
  - Quite large suite of protocols
  - Some deployed based on WebRTC decision
  - Not too much controversy here
- Negotiation protocols are NOT part of the specification
  - No SIP, XMPP or any other signalling protocol
  - Still need to provide API that allows these to be used

Network config - the quandary

- Both sides need to agree on IP addresses, codecs, multiplexing schemes, error correction and so on
- It SHOULD be possible for applications that don't care to ignore these details
  - But still benefit from technology advances (e.g. new codecs)
- Applications that care SHOULD be able to manipulate them
- Designing an API that serves both purposes is hard.

Network config - SDP

- SDP is a description language for network configuration
  - Chosen for having a track record
  - Not at all "Javascript-like"
- Functionality of SDP was not quite good enough
  - BUNDLE, "Unified Plan", Trickle-ICE
- Uses an offer/answer to find common subset of supported features
- Unloved format
- Controversial

Implementation status

- Chrome, Firefox
  - Video, audio, data
- Interworking
  - VP8 video codec, Opus audio codec
- Many details still unstable / unimplemented
  - Representation of multiple audio and video tracks
  - Multiplexing
  - Binary data transfer
- Implementation teams are cooperating well