P2Pvidchatxplatxamwebrtc

ROLL YOUR OWN HANGSKYPETIME

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P2P What?

P2Pvidchatxplatxamwebrtc

P2P: Peer-to-peer

vid: Video

chat: Chat

xplat: Cross platform

xam: Xamarin

webrtc: Web RTC

That’s not creative at all

Real-Time Video Chat

Traditional issues…

- Server dependent
- Network topology sensitivity
- Browser plugin required
- Proprietary
- Closed

Primer

From http://webrtc.org/

WebRTC is a free, open project that provides browsers and mobile applications with Real-Time Communications (RTC) capabilities via simple APIs.

Real-Time Communication

- Standard protocols
- Negotiates paths through network topologies
- Peer-to-peer with server relay fallback
- Plugin free
- Multiple implementations
- Encryption mandatory

Standard Status

W3C standard

"Working Draft"

- It technically is still evolving
- …but it has all the momentum and most support

CU-RTC-Web was a competing MS standard
Dead: contributed to W3C fall of 2012

ORTC is a more recent MS-inspired W3C project that has mandated compatibility with WebRTC

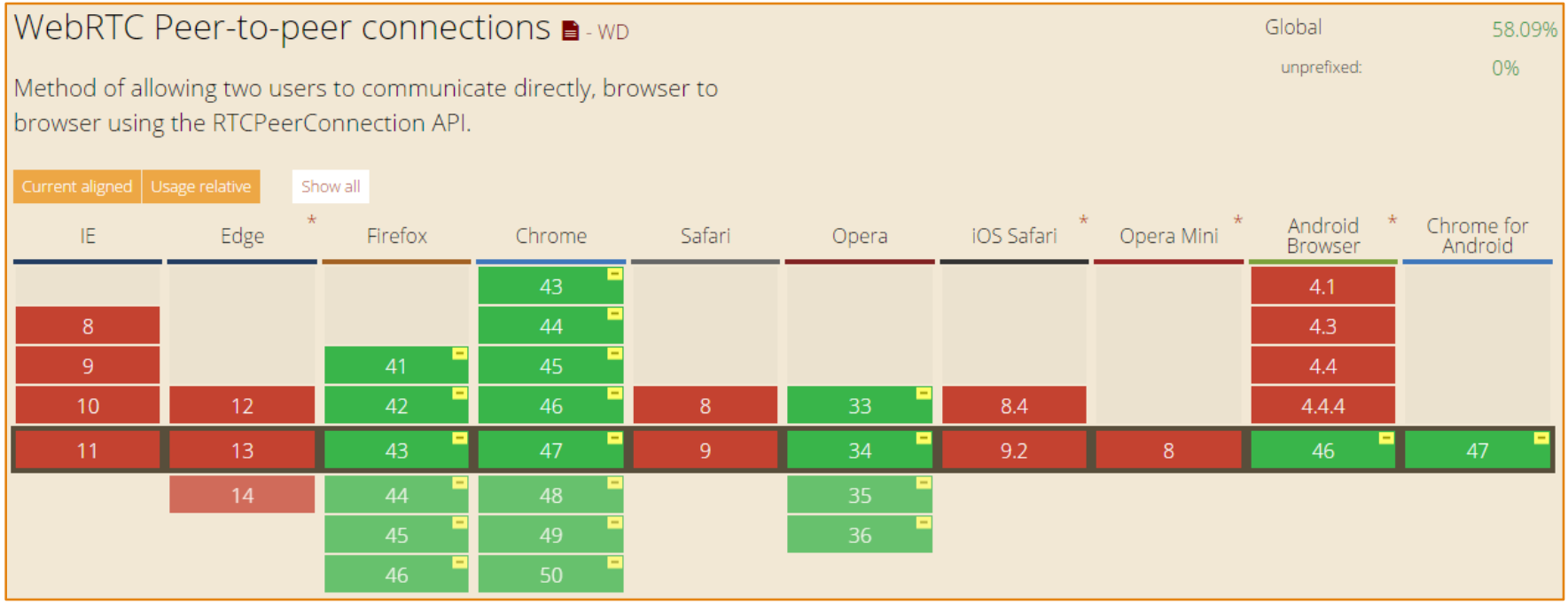
Support

Supported Browsers & Platforms

Chrome	*Firefox*	*Opera*	*Android*	*iOS*
				

Browser Support

From caniuse.com:



ACRONYM ALERT

NAT, SIP, SDP, STUN, TURN, ICE

NAT: Network Address Translation

SIP: Session Initialization Protocol

SDP: Session Description Protocol

WebRTC	Cheat Sheet
STUN: Session Traversal Utilities for NAT	Negotiation
TURN: Traversal Using Relays around NAT	Relay
ICE: Interactive Connectivity Establishment	SDP+STUN+TURN

Nice summary explanation: http://www.eyeball.com/standards/stun-turn-ice/

Signaling

The process of coordinating communication

Clients need to exchange information:

- Session control messages used to open or close communication
- Error messages
- Media metadata such as codecs and codec settings, bandwidth and media types
- Key data, used to establish secure connections
- Network data (i.e. host's external IP address, port, etc.)

The mechanism used for signaling is not covered by the WebRTC standards

CODECS

Encoder/decoders for the data being communicated

Voice: G.711, G.722, iLBC, iSAC

Video: VP8

Development Concerns

Client-side

- Various libraries to assist
- Do they cover all the platforms you need including mobile?
- Codec support

Server-side

- 3rd party library options but…trickier
- Going to host your own (regardless if on-premises or cloud-based)?
- Need TURN capability?
- Budget?

Both

- Signaling mechanism? WebSockets, XMPP, SignalR, proprietary, etc.

Get some ICE

There are some public STUN and TURN servers*

- **See this gist for a list: https://gist.github.com/yetithefoot/7592580**

Open source

- **Coturn: https://github.com/coturn/coturn**
- **PJSIP: http://www.pjsip.org/**

Vendors

- **Search for "WebRTC platform"**
- **Can be $$$$$ if using 3rd party servers**

IceLink

http://www.frozenmountain.com/

Implements both client and server side (ICE) libraries for WebRTC

“Libraries for darn near every platform”

Free community edition (WAN links limited to 30 seconds)

Easy to use sister product WebSync for signaling, or can bring your own

VTConnect

VTConnect℠

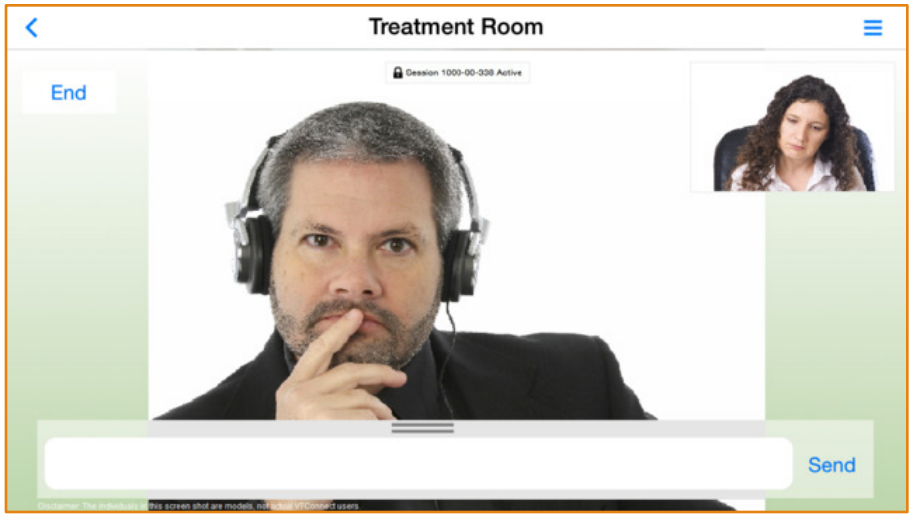
4-platform native product built with Frozen Mountain

Windows

GET IT ON Google play

Download on the App Store

Download on the Mac App Store



Public Sites

https://apprtc.appspot.com/

Google Sponsored / Powered by Google App Engine

https://demo.icelink.fm/

Frozen Mountain product demo

Hangskypetime Demo

Code Talking Points

Xamarin / Xamarin Forms
- Shared (not PCL) Project

Frozen Mountain
- Community Edition
- Drop-in code from examples

Views, ViewModels (and NotifyingObject)

Binding

Testability

Services
- Toast

Behavior

Limited conditional code / platform-specific code

Lessons Learned

3rd party pricing for servers was going to be expensive
- Went self-hosted with Frozen Mountain
- Not all services offer BAA agreements for HIPAA compliance

Geolocation of servers should be considered for hosting
- To reduce latency multiple geolocations were used

SignalR works as a signaling technology but…
- It doesn't guarantee order of delivery...
- So additional queing logic needed

Frozen Mountain has evolved and improved the product steadily

Public static IP's in Azure are doable these days
- (required for hosting TURN servers)

Wrap

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