P2Pvidchatxplatxamwebrtc

CREATE YOUR OWN “HANGSKYPETIME”

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Historic Issues

- Server in the middle required
- Network topology sensitivity
- Proprietary
- Closed
- Browser plugin required

Primer

WebRTC is a fre open project that provides h nd mobile applicat eal-Time Communicatio capabilities via si is.

http://webrtc.org/

Real-Time Communication

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

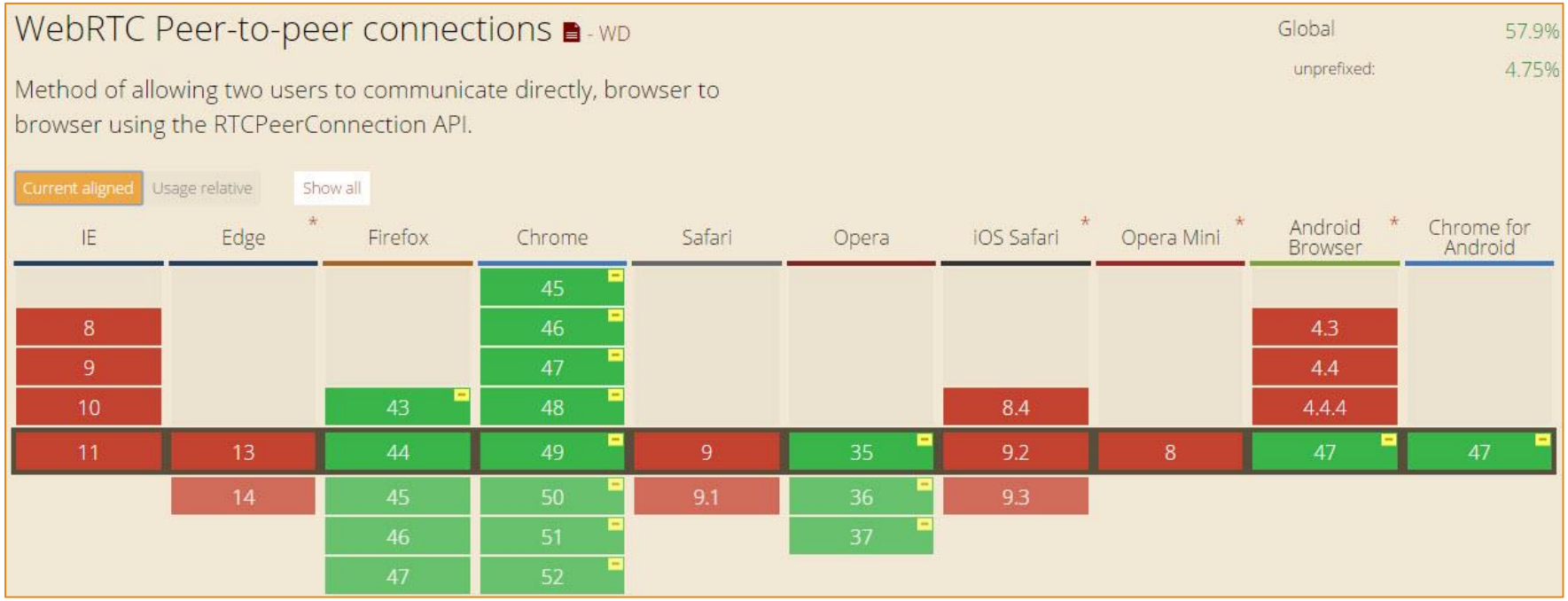
Support

Supported Browsers & Platforms

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

Browser Support

From caniuse.com:



Standard Status

W3C standard

"Working Draft"

- …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

- Builds on / has mandated compatibility with WebRTC
- As of March 2016 still only supported in MS Edge

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	Network Negotiation
TURN: Traversal Using Relays around NAT	Data 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

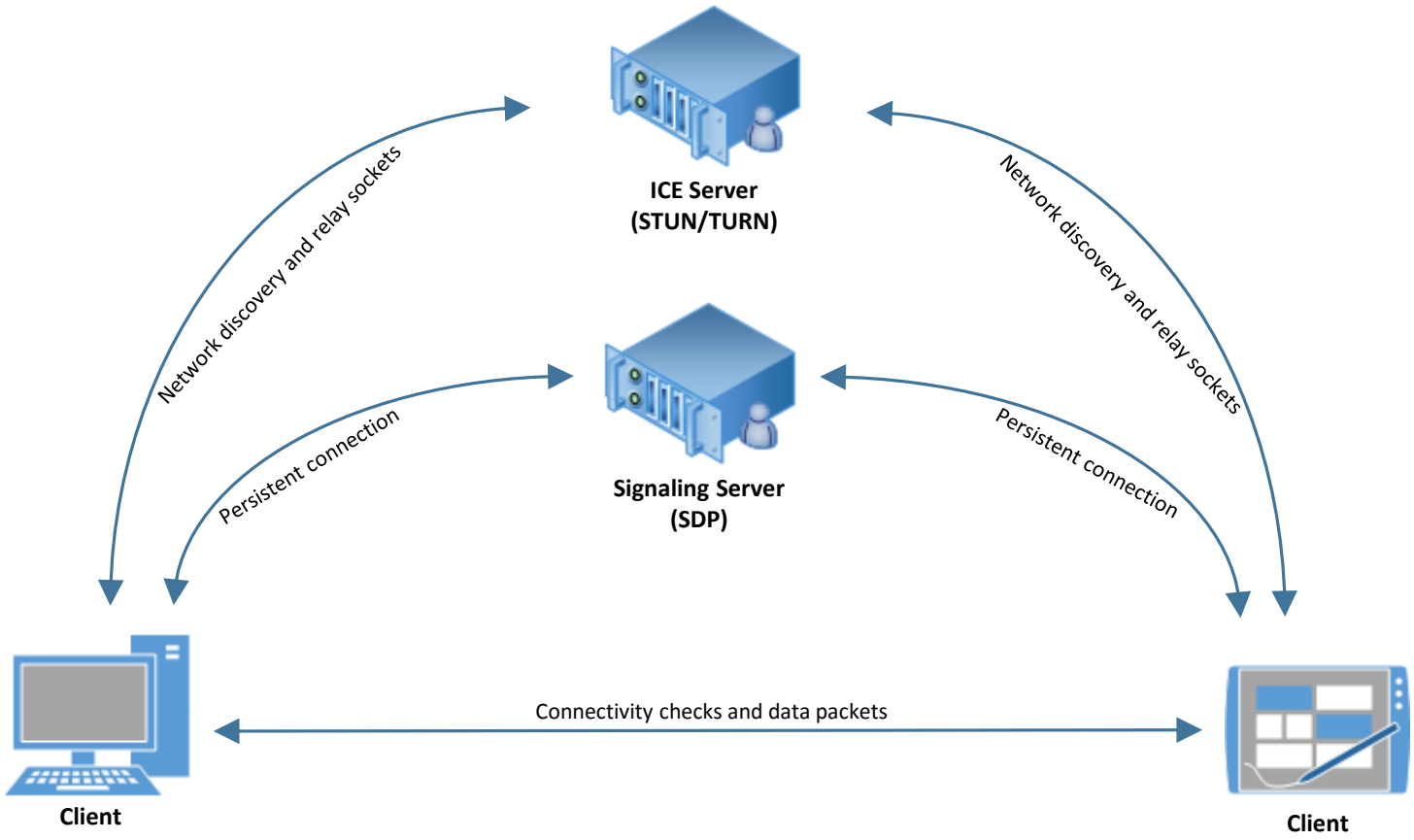
Clients need to exchange information:

- 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

http://www.html5rocks.com/en/tutorials/webrtc/infrastructure/ has a good explanation of signaling

Network Diagram



CODECS

Encoder/decoders for data transmitted (audio/video/other)

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

Video: VP8

https://webrtc.org/faq/#what-codecs-are-supported-in-webrtc

Where to find ICE

There are some public STUN and TURN servers*

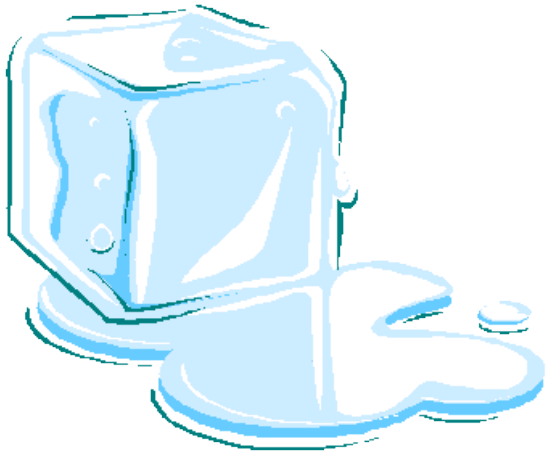
- See this gist for a list: https://gist.github.com/yetithefoot/7592580

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/

Both client and server components for WebRTC

“Libraries for darn near every platform”

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

Also provides VP8 and Opus codec implementations

Free community edition (WAN links limited to 30 seconds)

VTConnect

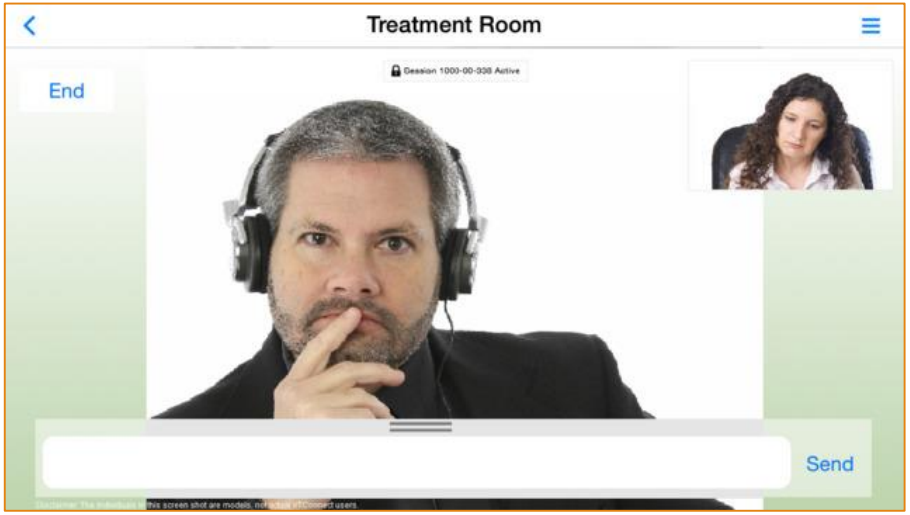
VTConnect℠

Windows

GET IT ON Google play

Download on the App Store

Download on the Mac App Store



Public Sites

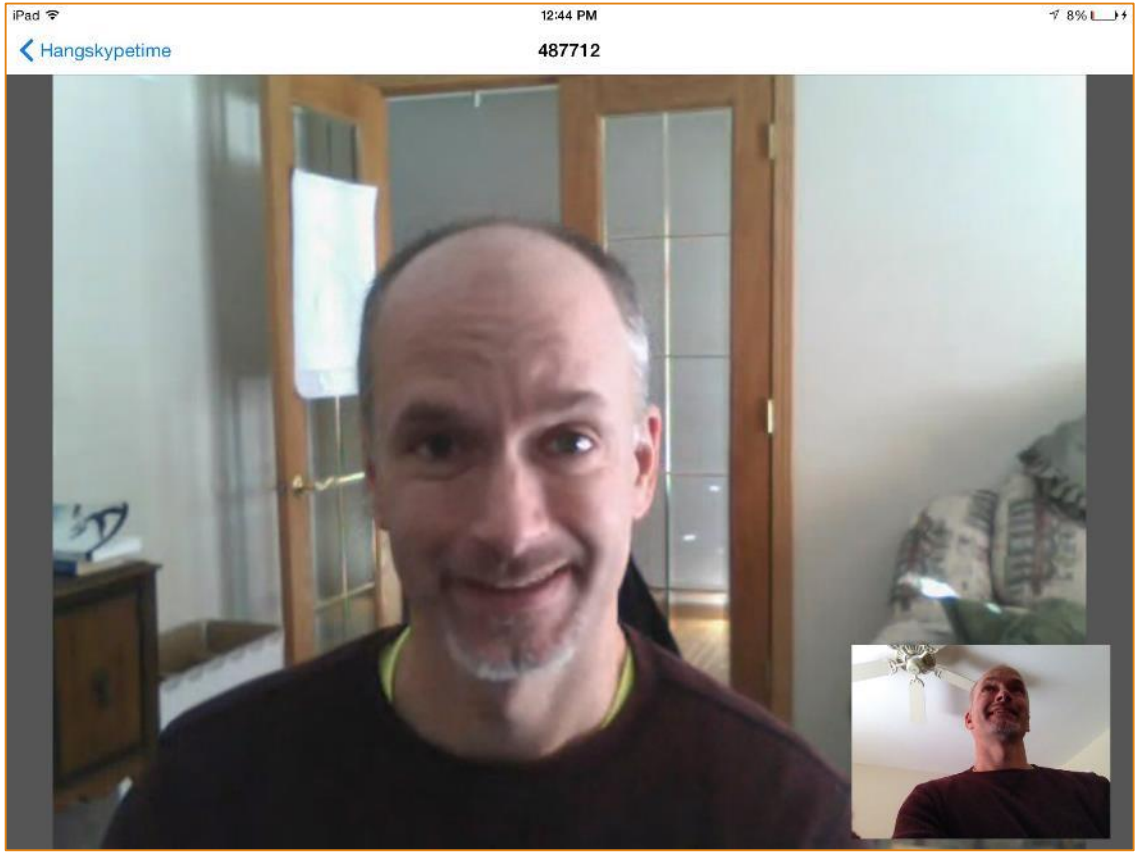
https://apprtc.appspot.com/

Google Sponsored / Powered by Google App Engine

https://demo.icelink.fm/

Frozen Mountain product demo

Hangskypetime



Code Talking Points

Xamarin Forms
- Shared Project (not a PCL)

XAML Binding

Behavior
- …MaxLength

Views, ViewModels

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

DI-capable Platform Services
- …Toast

Limited conditional code / platform-specific code

Lessons Learned

Using 3rd party servers was going to be expensive
- …so went self-hosted with Frozen Mountain

Not all services offer BAA agreements for HIPAA compliance (if required)

Frozen Mountain has evolved and improved steadily

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

Azure
- Public static IP's for ICE servers needs to be configured
  - The first 5 are free with paid accounts
  - https://azure.microsoft.com/en-us/documentation/articles/virtual-network-ip-addresses-overview-arm/
  - https://azure.microsoft.com/en-us/documentation/articles/virtual-network-deploy-static-pip-arm-portal/

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

Things to Think On

WebRTC – de facto standard

Cross-platform

- Browsers & JavaScript
- Xamarin & C#/F#

Vendor assists

- Frozen Mountain & others

Client Components

- Codecs

Server Components

- ICE and Signaling
- Public v. private
- Self-hosted v. hosted service

Wrap

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