



An Assessment of WebRTC Products Readiness for Video Remote Interpretation

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Overview

Requirements for social and physical distancing during the COVID-19 pandemic has made it difficult for sign language interpreters to accompany deaf or hard-of-hearing persons when they have to communicate with people who do not understand sign language.

It is now almost imperative to use remote sign language interpretation or video remote interpretation (VRI) services. VRI services are not only needed when on-site sign language interpreters are not available, but also in situations where on-site interpreters are not qualified for the assignment, or when last-minute or unexpected interpreting is needed. VRI is a perfect solution for education, healthcare, business meetings, and for government, social and financial services, and many more.

This report describes the recent work carried out by the Digitas Institute in its test-bed project to develop, test and deploy ICT accessibility solutions. We have focused on testing WebRTC based video remote interpretation services, aimed at deaf and hard-of-hearing communities. A summary of our findings is presented. The list of WebRTC products tested may be incomplete as the technology is still in development.

Introduction

At the Digitas Institute, we established a test-bed to develop, test and deploy ICT accessibility solutions. Amid the COVID-19 pandemics, we have focused on testing solutions aimed at deaf and hard-of-hearing communities that include but are not limited to video remote interpretation services (VRI), video relay services (VRS), and captioning provided by means of the ICT and digital technology.

VRI services are required when on-site sign language interpreters are not available or when it is not appropriate for the interpreters to accompany a person due to the pandemics. Other situations where using VRI is beneficial include on-demand access to qualified sign language interpreters, access to interpreters when on-site interpreters are not available, and access to a larger pool of qualified and/or certified interpreters. They are appropriate for last-minute or unexpected interpreting needs and enable access to a qualified interpreter when the on-site interpreter is not qualified for the assignment. When used appropriately, VRI services are also cost effective.

We have tested a range of WebRTC products and examined their usability and appropriateness for the provision of VRI services to the deaf and hard-of-hearing communities. A summary of our findings is presented in this report.

Definitions

Web Real-Time Communication (WebRTC): WebRTC is a set of protocols and Application Programming Interfaces (APIs) standardised by the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C). It enables web applications and sites to capture and stream audio and/or video media, as well as to exchange arbitrary data between browsers using peer-to-peer real-time communication, without requiring an intermediary.

Video relay services (VRS): VRS is a type of electronic communications relay service that enables a deaf or hard-of-hearing person to make and receive telephone calls to and/or from a hearing person through a communications assistant who is a qualified sign language interpreter.

Video remote interpretation (services) (VRI): VRI is a service that provides remote sign language interpretation between a deaf or hard-of-hearing person and a hearing person using video-conferencing technology. VRI enables a sign language interpreter to assist communication between deaf or hard-of-hearing persons and hearing persons over the internet using digital technology, such as a computer, tablet or smartphone.

Methodology

We have closely considered over two dozens of WebRTC products and tested their usability as well as appropriateness for the provision of VRI services to the deaf and hard-of-hearing communities.

Following the general requirements as defined by the ITU-T Technical Paper FSTP.ACC-WebVRI on Web-based remote sign language interpretation, we concentrated on web-based video-conferencing products. Systems that required downloading on both desktop and mobile platforms, even though based on WebRTC, were excluded. We narrowed the selection and performed more comprehensive testing. We chose products that worked in different browsers, such as Chrome, Edge, Firefox and Safari. The products were tested on Windows and OS X desktop platforms, as well as on Android and iOS mobile platforms.

Information about different products was collected from the products' respective websites and the products were tested with users participating in our testbed activities.

Countries were assigned to products based on the information we found. Companies are headquartered in particular countries, while open-source development

teams can be managed from one country, or have a contact address. For certain products, we could not assign the country.

We do not claim that the list of WebRTC products that fit into our selection criteria is complete. Products have been developed and improved continuously and new products could be added to the list. However, we believe we have captured the most relevant products.

Findings

The following table is a listing of WebRTC products tested. We list WebRTC products that do not require any application download¹. These products are candidates for compliance with the ITU-T FSTP.ACC-WebVRI guidelines.

Explanation of the fields:

- I. **Product Name:** The name of the WebRTC product.
- II. **Country:** The country in which the company or programmers are based. In some cases this is misleading, as many development teams are international. Some teams may deliberately hide their nation of origin.
- III. **Free/Paid (F/P):** Several products are available free and only Application Programming Interfaces (API), when available, are offered commercially, while some products are available both in free and paid plans. When provided free, sign-up (registration) is often not required.
- IV. **Purpose:** The general purpose of the products as marketed by the providers is indicated. Some products have primarily been developed for video chats or meetings, and others for web conferencing or educational purposes.
- V. **Assessment:** The products have been assessed by our team for their usability and appropriateness for the provision of VRI services in accordance with the following levels: (-1) download required, (1) very poor; (2) poor, (3) passible, (4) good, (5) very good.
- VI. **Comments:** A summary of the team's comments is provided for each product.

¹ Some platforms may require an application download for mobile platforms. In that case, we mark them with the assessment -1 as they are not suitable for VRI on mobile platforms. They can, however, be used for VRI services on desktop platforms.

Table: Assessment of WebRTC products' readiness for VRI systems²

Product Name	Country	Free/Paid	Purpose	Assessment	Comments
BlueJeans	USA	P	General: video calls, video group chats, video meetings, video conferences	-1	Mobile version requires app download, which is strongly forced on user (link to web-version hard to find). Registration required. User Interface (UI) difficult to use (no explanation, no intuitive guidance), esp. for persons with disabilities (PWDs). Display small, may be difficult for VRI. Good audio/video quality. Good breakout rooms, but not needed for VRI.
Discord	USA	F	General: video calls, video group chats, video meetings, (initially developed for gamers)	-1	Open source, API provided. Mobile version requires app download. Registration required. Very complicated for PWDs.
Element	UK	F	General: secure video calls, video group chats and sharing	-1	Open source, based on Matrix. Mobile version requires app download. Registration required. Secure. Entry/exit may be difficult for PWDs. Too complicated to be used for VRI.
Eyeson	Austria	P	General: video calls, video group chats, video meetings	1	Registration required. UI simple and easy to understand. Very poor video quality (frames stop, video drops).
JumpChat	Austria	F	General: video calls, video group chats, video meetings	1	No registration required. Safe and secure. UI simple and easy to understand. On mobile platforms (esp. smartphones) very hard for PWDs. Poor video quality.

² Other products, such as WebEX, GoToMeeting, MS Teams, and other popular communication platforms using WebRTC, were also examined but they all require an application download for desktop platforms.

Product Name	Country	Free/ Paid	Purpose	Assessment	Comments
Talky	USA	F	General: video calls, video group chats and sharing	1	No registration required. UI different from others, may be confusing for PWDs. Poor video quality.
Uber Conference	USA	F/P	General: video calls, video group chats, video meetings	1	Registration required. Not privacy friendly, may not be safe. Too many advertisements. Simple entry. Poor video quality.
VideoLink2me	Russia	F	General: video calls, video group chats	1	No registration required. Too many advertisements. Entry page confusing. Poor video quality.
Linkello	France	F/P	General: video calls, video group chats	2	API provided. Registration required for paid plans. Entry/exit easy for PWDs. UI not flexible. Poor video quality, not appropriate for VRI. Bugs reported during tests. Used for medical audio/video consultations in France.
PalavaTV	Germany	F	General: video calls, video group chats	2	Open source, run by a non-profit organisation. No registration required. Simple to use. In some cases, it is not possible to create a media connection. Poor (not stable) video quality.
Sylaps	France/USA	F/P	General: video calls, video group chats and sharing	2	Registration required to enable conversation history. Not privacy friendly, may not be safe. Complicated entry. UI is good, but may not be suitable for PWDs. Download coaxed on mobile. Vocal assistant provided.
Talkroom	India/USA	F	General: video calls, video group chats	2	Developed by Galaxy Weblinks. Simple UI, entry room name is always required on entry and is not automatically assigned. Poor video quality.

Product Name	Country	Free/ Paid	Purpose	Assessment	Comments
Vonage	USA	F/P	General: video calls, video group chats, video meetings	2	Open source, API provided. No registration required for free version. Good features for UI, not flexible enough for VRI. Poor audio/video quality, not appropriate for VRI. Big banner uses screen space.
BigBlueButton	International	F	General: video calls, video meetings, video conferences, designed for online learning	3	Open source, self hosted. Registration required. Entry/exit difficult for PWDs. UI difficult for PWDs. Good audio/video quality.
Bizmee	Japan	F	General: video group chats, video meetings, video conferencing, targeted at team and business meetings	3	Based on Peer.js, an older WebRTC library unsupported since 2015. No registration required. UI simple and easy to understand, designed for team or business meetings and on-line collaboration. Flexible UI, windows can be moved around, but participants' windows cannot be enlarged or pinned. Big white-board area for drawing takes up space. Not appropriate for VRI. Too many advertisements (pop-up ads). Good voice and video quality.
FramaTalk	France	F	General: video calls, video group chats	3	Based on Jitsi Meet, same comments apply.
Google Meet	USA	F/P	General: video calls, video group chats, video meetings, video conferences	3	Registration required and Google account required. Log-in difficult. Automatic captioning provided, currently available only in English.

Product Name	Country	Free/Paid	Purpose	Assessment	Comments
Gruveo	Slovak Republic	P	General: video calls, video group chats, video meetings, video conferences	3	API provided. Free trial offered, but registration required. Simple UI. Audio and video quality not sufficiently stable for VRI.
Jitsi Meet	France	F	General: video group chats, video meetings, video conferencing, video casting	3	Open-source, can also be self-hosted. API provided. No registration required. Safe and secure. UI simple and easy to understand. Video quality not sufficiently stable for VRI.
Webrtc.free-solutions	Switzerland	F	General: video calls, video group chats, video meetings	3	Based on Jitsi Meet, same comments apply. Captioning can be provided.
Whereby	Norway	F/P	General: video calls, video group chats, video meetings, video conferences – depending on the plan	3	API provided for paid plans (used e.g. by Tacnom.com). Registration required. Entry/exit may be difficult for PWDs. UI appropriate for PWDs. Youtube and Google Docs integration. Poor audio/video quality.
SkyWay (open version)	Japan	F	General: video calls, video group chats, video meetings, video conferences	4	Open source, API provided. No registration required. Provides explicit choice between Selective Forwarding Unit (SFU) and Mesh configuration. Entry/exit may be difficult for PWDs. UI too simple and inflexible, improvements required. Good voice and video quality, satisfactory for VRI.
SkyRTC	Japan	P	Specific: Telecom VRS	5	Based on SkyWay API (business version). Used for VRS by the Japanese government. UI designed for PWDs. Good voice and video quality.

References

1. ITU-T Technical Paper (Approved on 3 July 2020). *FSTP.ACC-WebVRI Guideline on Web-based Remote Sign Language Interpretation (VRI)*, available as SG16-TD449/PLEN.
 2. WebRTC 1.0 (13 December 2019). *Real-time Communication Between Browsers, Candidate Recommendation*, World Wide Web Consortium (W3C).
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