Security Aspects of Video Conference Products

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Product Overview

Product Name	Vendor	Detailed information
Skype for Business (Lync)	Microsoft	Part of Microsoft Office. Website recommends Teams.
Teams	Microsoft	https://products.office.com/en-us/microsoft-teams/group-chat-software
Facetime	Apple	Part of macOS and iOS. No separate website.
Hangouts / Google Meet	Google	https://hangouts.google.com, https://meet.google.com
Skype (classic)	Microsoft	https://www.skype.com
WebEx	Cisco	https://www.webex.com
Zoom	Zoom	https://zoom.us
Jitsi Meet	open source (8x8)	https://jitsi.org/jitsi-meet
Nextcloud Talk	open source (Nextcloud)	https://nextcloud.com/talk/

Considered Criteria

We considered products with the following minimum functionality: Audio, video, screen sharing.

In addition, we are comparing the following aspects:

User Authentication

- Accounts, integration to AD/LDAP
- Authentication methods
- Invitation of external participants

Data Sovereignty

- Cloud-based service
- Servers on premise
- Data encryption

Client Setup (Including Guests)

- Supported platforms
- Client software required
- Proprietary browser plugin required
- Runs in standard browser (WebRTC)

Proxy Requirements for Clients

- HTTP, WebSocket, WebRTC
- non-standard TCP or UDP ports

Exclusions

Selection of products

There is a large number of products which implement video conferencing. This includes consumer messenger apps that converge into conference products since they started supporting calls with multiple users.

In this document, only conference solutions targeting **business use cases** have been considered. A more extensive list of conference solutions can be found in Wikipedia:

https://en.wikipedia.org/wiki/Comparison_of_web_conferencing_software

End-to-end encryption

Our focus is on business conferences with more than two participants. For these configurations, we assume that the voice and video data is available in plaintext on the conference server (i.e. no end-to-end encryption).

If a solution allows for hosting on premise, plaintext data on the conference server is considered acceptable.

Skype for Business (formerly Lync) (Microsoft)

Skype for Business is the telephony and video conference solution in the Microsoft Office/Exchange environment. It was originally named Lync and was rebranded after Microsoft acquired the "Skype" brand. It is not to be confused with the Skype messenger targeting consumer audiences.

Microsoft is asking users to switch to Teams, which is developed with Office 365.

Advantages

- integrated in Office/Exchange ecosystem
- Skype for Business servers operated on premise
- dial-in with phone number possible

Disadvantages

- Proprietary client software or browser plugin required
- Microsoft developers are focusing on Teams

Teams (Microsoft)

Teams is a new collaboration software developed by Microsoft for the Office 365 cloud platform. The application is a web application which can be run in browsers or locally as Electron app.

Advantages

- integrated in Office ecosystem

- dial-in with phone number possible

- runs in standard browsers without plugin (WebRTC)

- works via HTTP connections

Disadvantages

- cloud-based, servers not on premise

Facetime (Apple)

Facetime is the default video telephony application on Apple devices (Macs, iPhones, iPads). It is also capable of conference calls.

Advantages

- works out of the box

Disadvantages

- Client software required
- only available for Apple devices
- cloud-based, servers not on premise
- dependent on Apple ID accounts

Hangouts / Google Meet (Google)

Hangouts is the video conference application within the Google/GMail/Android ecosystem. Google has announced to end the Hangouts some time ago, the conference functionality is available as Google Meet. At time of writing, both services are still online.

Advantages

- works out of the box with Google accounts

- runs in standard browsers without plugin (WebRTC)

- works via HTTP connections

Disadvantages

- cloud-based, servers not on premise

- dependent on Google accounts

Skype (Classic)

Skype is one of the oldest instant messaging and video call applications. It is also capable of video conferences with multiple participants. Skype has been acquired by Microsoft.

Advantages

- free to use

Disadvantages

- cloud-based, servers not on premise
- account required (temporarily suspended)
- requires fat client or supported browser (Edge)

WebEx (Cisco)

WebEx is a business communication solution provided by Cisco.

Advantages

- invitation of external participants without accounts

- dial-in with phone number possible

- runs in standard browsers without plugin (WebRTC)

- works via HTTP connections

Disadvantages

- cloud-based, servers not on premise

Zoom

Zoom is an easy to use video conferencing solution that has gained popularity in recent time.

Advantages

- free basic functionality for non-commercial use
- easy to use

Disadvantages

- proprietary client software required
- cloud-based, servers not on premise
- bad track record of software quality and problem handling [summary]
- banned by a number of authorities and by some companies

Jitsi Meet

Jitsi is an open source project developing a number of messaging and video tools since 2002.

Advantages

- open source software, actively developed
- server can be operated on premise (easy setup on a Debian-based Linux server)
- runs in standard browsers without plugin (WebRTC)
- works via HTTP connections

Disadvantages

- no integration with other applications

Nextcloud Talk

Nextcloud is an open source implementation of cloud services for self-hosting. It is written in PHP and includes video conference functionality with the Nextcloud Talk app.

Advantages

- open source software
- hosted on premise
- runs in standard browsers without plugin (WebRTC)
- works via HTTP connections

Disadvantages

- complex Nextcloud infrastructure setup required
- limited support for free version

Product Comparison

Product name	User Authentication	Data Sovereignty	Client Setup (Including Guests)	Proxy Requirements for Clients
Skype for Business (Lync)	company accounts (Active Directory)	server on premise	client software or proprietary plugin	non-HTTP connections
Teams	company accounts (Active Directory)	Office 365 (SLA available)	any browser (WebRTC)	none (HTTP based)
Facetime	Apple ID accounts	cloud-based	Apple device	non-HTTP connections
Hangouts / Google Meet	Google accounts	cloud-based	any browser (WebRTC)	none (HTTP based)
Skype (classic)	Microsoft accounts	cloud-based	supported browsers only	non-HTTP connections
WebEx	company accounts (Active Directory)	cloud-based (SLA available)	any browser (WebRTC)	none (HTTP based)
Zoom	Zoom accounts or OAuth federation	cloud-based	insecure client	non-HTTP connections
Jitsi Meet	random session IDs	server on premise	any browser (WebRTC)	none (HTTP based)
Nextcloud Talk	local Nextcloud accounts	server on premise	any browser (WebRTC)	none (HTTP based)

Recommendations

- For **sensitive data**, we recommend a solution which is operated **on premise**.
  - Within Microsoft Office/Exchange ecosystems, Skype for Business is an acceptable solution.
  - If no infrastructure exists, setting up Jitsi Meet **on premise** could be worth the effort.

- If **conferences with guests** are required, a WebRTC-enabled solution is preferable. This allows guests to join with any modern browser without installing client software or proprietary plugins.

- A **cloud-based solution** should only be considered if the handled data is **not sensitive**.

- Zoom should only be used for data which **could be made public** without problems for all participants. This is due to Zoom's bad track record of security problems. Moreover, sensitive users will already consider installing the Zoom client software a risk.

Thank you for your attention!

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