Comparison of Instant Messengers

There are probably a hundred or more different instant messengers out there. But which one respects your privacy, is resistant to censorship attempts by governments and Big Tech, and is easy to use for normies?
I have limited this comparison to only eleven messengers:

- SimpleX, a private messenger that doesn't need accounts or user ID
- XMPP, the pioneer of FOSS and federated instant messengers. XMPP is just a protocol and not an application; in this article it is represented by the Android app Conversations.
- Delta Chat, which is based on normal email and hence has the greatest theoretical userbase among all federated messengers.
- Matrix, a new and very promising federated protocol, here represented by the leading client Element.
- Signal, the most mainstream end-to-end (E2E) encrypted FOSS messenger.
- Telegram, the most mainstream FOSS messenger, and market leader in some countries.
- Threema, the most mainstream E2E-encrypted FOSS messenger with the option of anonymous accounts.
- Facebook Messenger, the second most popular messenger worldwide.
- Line, the most popular messenger in Japan, Taiwan, and Thailand.
- Viber, as it is the most popular messenger in some countries.
- WhatsApp, the #1 most popular messenger worldwide.

Some messengers that are relevant but did not make it on the list:

- iMessage (+FaceTime): not available on Android
- RCS (Google Messages): not available on iOS
- Anything else made by Google: Google Chat, Google Meet, Google Duo, Google Hangouts, it's hard to follow what they're pushing at the moment. They keep deprecating and reinventing their IM apps. It's too tiresome to follow and they won't ever make a breakthrough anyway. Should have kept Google Talk, which was simply an XMPP client.
- Skype: Not market leader in any country (anymore), cannibalized by Microsoft Teams
- Briar: Peer-to-peer messenger with the most mindshare, but low adoption, limited functionality (only text messages), not available for iOS
- Tox: Another well-known P2P messenger, supports more platforms than Briar, but low adoption.
- ICQ: One of the first, and historically very popular, IMs. ~~It's still around but with a small number of active users.~~ Shut down in June 2024 :(
- WeChat: The market leader in China, and third most popular IM worldwide, but it's a privacy nightmare and there's no reason to use WeChat if you're not Chinese or living in China.
- KakaoTalk: The market leader in South Korea, but low adoption elsewhere.
- IRC: A protocol with many clients and server federation. Unlike XMPP for example, IRC focuses mostly on group chats rather than 1:1 instant messaging.
- Discord: Quite popular, but mostly focuses on group and voice chats. Privacy nightmare.
- Kik: Quite popular, but not #1 anywhere
- Snapchat: Quite popular, but more like a social media than pure IM, and not #1 in any country.
- QQ: Second most popular messenger in China. But if WeChat doesn't make it on list, QQ won't make it either.
- Wire, Wickr, Slack, Microsoft Teams, BBMe, Mattermost: Focus on enterprise users.
- Session, Jami: Great privacy, but low adoption.
- Instagram, LinkedIn: Mainly social media rather than a messenger.
- Mumble, Teamspeak: Voice chat focus.

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Source: eylenburg.github.io

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	Decentralized/Federated & FOSS			Centralized & FOSS			Proprietary Market Leaders			
	SimpleX	**Conversations (XMPP)**	**Delta Chat**	**Element (Matrix)**	**Signal**	**Telegram**	**Threema**	**Facebook Messenger**	**Line**	**Viber**	**WhatsApp**
General information											
Year introduced	2021	2014 (XMPP: 1999)	2017	2016 (Matrix: 2014)	2014	2013	2012	2011	2011	2010	2009
Developer	SimpleX Chat Ltd	mainly Daniel Gultsch	various developers	The Matrix.org Foundation CIC	Signal Technology Foundation	Telegram FZ LLC	Threema GmbH	Facebook, Inc.	LINE Corporation	Rakuten Group, Inc.	Facebook, Inc.
Domicile of developer	UK	Germany	Germany	UK	USA	UAE	Switzerland	USA	Japan	Japan	USA
Monthly active users	n/a (decentralized)	n/a (decentralized)	n/a (decentralized)	n/a (decentralized)	40 million	900 million	10 million	1.3 billion	250 million	825 million	2.0 billion
Play Store number of installs	50,000+	100,000+	100,000+	1,000,000+	100,000,000+	500,000,000+	5,000,000+	5,000,000,000+	500,000,000+	1,000,000,000+	5,000,000,000+
Protocol used	SimpleX + Signal	XMPP + OMEMO	IMAP/SMTP + OpenPGP	Matrix + Olm/Megolm	Signal	MTProto	NaCl + Ibex	MQTT + Signal	MQTT + Letter Sealing	Viber	XMPP + Signal
Price	free	free	free	free	free	free	€3.99	free	free	free	free
Sustainability											
License of client/server	AGPL	GPL	GPL	Apache	GPL	GPL/Proprietary	AGPL/Proprietary	Proprietary	Proprietary	Proprietary	Proprietary
Server architecture	Decentralized	Federated	Federated	Federated	Centralized	Centralized	Centralized	Centralized	Centralized	Centralized	Centralized
Ability to self-host server	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No

	Decentralized/Federated & FOSS			Centralized & FOSS			Proprietary Market Leaders			
	SimpleX	**Conversations (XMPP)**	**Delta Chat**	**Element (Matrix)**	**Signal**	**Telegram**	**Threema**	**Facebook Messenger**	**Line**	**Viber**	**WhatsApp**
Compatibility with other messengers	No	Via transports if supported by server	Fallback to normal Email; more via bridges	Via bridges if supported by server	No (SMS in earlier versions)	No	No	No (Instagram & SMS in earlier versions)	No	No	No
Compatibility											
Android	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (needs Google Play for push notifications)	Yes (needs Google Play for push notifications)	Yes	Yes
iOS	Yes	Other XMPP client(s)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows	Yes	Other XMPP client(s)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
macOS	Yes	Other XMPP client(s)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GNU/Linux	Yes	Other XMPP client(s)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
Unix & BSD	No	Other XMPP client(s)	No	Other Matrix client(s)	No	FreeBSD / other client(s)	No	No	No	No	No
Web browser	No	Other XMPP client(s)	No	Yes	No	Yes	Yes	Yes	Chrome extension	Yes	Yes
Capability											
Offline messages (if recipient is offline)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Group chats	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Voice messages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Voice and video calls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Send photos, video and other files	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Screensharing	No	No	No	Yes (not on mobile)	Yes (not on mobile)	Yes	No	Yes (not on mobile)	Yes (not on mobile)	Yes (not on mobile)	No
Public/searchable groups	Yes	Yes	No	Yes	No	Yes	No	No	No	Yes	No
Ephemeral (self-destructing) messages	Yes	Only on local device	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Delete messages on device of recipients	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes
Use with multiple accounts/profiles	Yes	Yes	Yes	Other Matrix client(s)	No	Yes	No	No	No	No	No
Usability											
Find contacts from device address book	No	other XMPP clients	Email	Phone number & Email	Phone number	Phone number	Phone number & Email	Phone number & Email	Phone number	Phone number	Phone number
Automatic backups of chat history	No, need to manually export chat database for backups.	Chat history is saved on the XMPP server, but useless without decryption keys, which some other XMPP clients can back up automatically (Conversations: only *manual* backups to local device).	Local backups of chat history are possible but not automatic. Chat history is saved on the Email server, but useless without decryption keys, which need to be *manually* backed up to local device.	Chat history is saved on the Matrix server, but useless without decryption keys, which can be automatically backed up to local device or Matrix homeserver	Backup on local device only (no cloud backup which would protect against loss of device)	All data is saved on Telegram servers, except for "secret chats"	No	Yes (All data is saved on Facebook servers)	Backup to cloud only (Google Drive/iCloud), and text messages only	Backup to cloud only (Google Drive/iCloud)	Backup to cloud only (Google Drive/iCloud)
Data can be transferred to new device	Yes (export/import database)	Yes (at least to new installation of Conversations)	Yes	Yes	Yes, but only Android ↔ Android or iOS ↔ iOS, not supported on Desktop	Yes, except for secret chats	Yes, but only Android ↔ Android or iOS ↔ iOS, not supported on Desktop	Yes	Text messages only, and only Android ↔ Android or iOS ↔ iOS, not supported on Desktop	Yes, but only Android ↔ Android or iOS ↔ iOS, not supported on Desktop	Yes, also between Android and iOS using "Move to iOS" and "Switch to Android" apps
Use on multiple devices	Can link desktop & mobile app, but mobile app must be running and be on the same local network.	Yes	Yes	Yes	Yes, but only one Android*/iOS device (but: can have linked iPad) *possible with Molly	Yes, except for "secret chats"	Yes, but only one Android/iOS device	Yes	Yes, but only one Android/iOS device	Yes, but only one Android/iOS device	Yes (needs a "primary device" running Android or iOS)
Import chat history from other messengers	No	No (from other XMPP clients only)	No	No (from other Matrix clients only)	No (SMS import possible in earlier versions)	Yes (KakaoTalk, Line, WhatsApp)	No	No (SMS import possible in earlier versions)	No	No	No
Privacy											
User ID	None (connect via 1-time invitation link or optional SimpleX contact address)	XMPP address (user@server.tld)	Email address (user@server.tld)	Matrix ID (@user:server.tld)	Phone number or Username	Phone number or "Fragment" number	Threema ID (8-digit ID)	Email address of Facebook account	Phone number	Phone number	Phone number
Anonymous sign-up possible	Yes	Yes	Yes	Yes	Phone number required	Possible with "Fragment" number (paid)	Yes if purchased anonymously	Facebook requires real identity to sign up	Phone number required	Phone number required	Phone number required
E2E encryption of 1:1 text messages	Yes	Yes	Yes	Yes	Yes	Only in "secret chats"	Yes	Yes (claimed)	Yes (claimed)	Yes (claimed)	Yes (claimed)
E2E encryption of group chats	Yes	Yes	Yes	Yes	Yes	No	Yes	Opt-in	Yes (claimed)	Yes (claimed)	Yes (claimed)
E2E encryption of voice and video calls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (claimed)	Yes (claimed)	Yes (claimed)	Yes (claimed)
E2E encryption of chat backups	Local database exports are encrypted	Yes	Local backups: no, on email server: yes	Yes	Yes	No ("secret chats" not backed up)	Yes	Group chats & legacy chats: opt-in encryption	?	No	Optional, therefore pointless
Minimal metadata	Yes	No	No	No	Yes	No	Yes	No	No	No	No
Security											
Encryption: Authentification of contacts	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encryption: Forward secrecy	Yes	Yes	No	other Matrix clients	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encryption: Plausible deniability	Yes	Yes	No	Yes	Yes	?	No	Yes	?	Yes	Yes
Post-quantum encryption	Yes	No	No	No	Yes	No	No	No	No	No	No
Lock app with password/biometrics	Yes	No	No	Mobile apps only	Mobile apps only	Yes	Yes	No	No	Desktop app only	Yes

So, what's the conclusion?

- In an ideal world, everyone would use decentralized or federated messengers, so that no company has the power to ban users or sell out to a Big Tech oligopolist such as Meta, Apple, Google, Microsoft, or Amazon, and so that people can self-host their own servers and thereby circumvent censorship attempts.
  - At the moment, Matrix seems to be the most popular. It has decent client apps across all major platforms, supports all the important features, and has optional contact discovery.
  - XMPP has a very lightweight and easy to set up server software. Furthermore it is a standardized protocol that has been around since 1999 and is the basis for other messengers such as Whatsapp. The main problem with XMPP is the fact that there isn't any client app which works across all major operating systems and has implemented all the important features (such as video calling). I believe that this is a roadblock to more widespread adoption among the less technologically inclined ("Oh you have an

iPhone? Then you need to download Siskin, not Conversations.").
    - Delta Chat has the advantage that everyone already has an email address so there are billions of potential users which already have each other saved in their address books. However, the email protocol has its own limits, for example you can't conduct voice or video calls. Because of this, I don't think that Delta Chat will have a realistic chance of ever replacing WhatsApp.
    - SimpleX probably has the best privacy and anonymity of all the messengers compared here, but it is a relatively new app with few users.
- Signal is the best choice among the centralized messengers . It has the best privacy out of all major messengers (XMPP and Matrix leak metadata, Signal doesn't), ~~it can be used as the default SMS app on Android which is a huge selling point when trying to get friends and family to install it,~~not anymore and its interface and setup are familiar to anyone who has used WhatsApp. However, Signal needs your phone number, so you can't sign up anonymously if your country forbids the anonymous purchase of SIM cards. Otherwise, the main downside is that Signal is using centralized servers, hence there is always a risk that Signal will be acquired by a privacy-hostile company. Furthermore, the Signal developers do not allow third-party clients, so users of niche operating systems are excluded.
- Telegram has lots of features and encourages the development of third-party clients. It's probably the best messenger if you don't care too much about privacy. The main downside is that chats are not E2E encrypted by default, and the E2E encrypted secret chats don't sync across devices. Furthermore, it is centralized and was forced to censor in the past (e.g. in 2022 they blocked over 60 public channels for German users after being threatened by the German government).
- Threema is good from a privacy perspective and allows users to sign up without giving up their phone number. The main problem I see is that the app costs money. It's not much, and it's good to know how the development is financed, but it is a major showstopper for widespread adoption.
- Among the big proprietary messengers, Whatsapp, Line and Viber E2E-encrypt all messages by default, which is great. However, you can never be sure that the company or the government doesn't hold the keys to access your messages, as the apps are closed source and can't be audited. Furthermore, the cloud chat backups of the proprietary messengers are not E2E encrypted. If backups are not end-to-end encrypted, then even if you don't upload your chat history to the cloud, your conversation partner may do so, and this effectively makes the rest of the E2E encryption pointless, because Apple/Google and the US government can read your messages in the cloud backup. WhatsApp offers E2EE for backups as an optional feature, however unless *all* parties in a chat have it enabled, this encryption can be circumvented. Furthermore, device-level backups on iPhone will store the unencrypted Whatsapp chats in iCloud unless the user has enabled "advanced data protection" (E2EE device backup) which is an opt-in feature. Hence it is more likely than not that your conversation partner has an unencrypted chat backup in a cloud somewhere and that ultimately WhatsApp's end-to-end encryption is just privacy theatre if someone "serious" (like the US government) wants to see your chats.

Do you have any comments or corrections? **Please drop me an e-mail** or **create an issue on Github**

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