[matrix]

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An open network for secure, decentralized communication

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Imagine a world...

...where it is as simple to message or call anyone as it is to send them an email.

...where you can communicate without being forced to install the same app.

...where you can choose who hosts your communication.

...where your conversations are secured by E2E encryption.

This is Matrix.

Matrix is an open source project that publishes the
Matrix open standard for secure, decentralised, real-time
communication, and its Apache licensed
reference implementations.

Maintained by the non-profit Matrix.org Foundation, we aim
to create an open platform which is as independent, vibrant and
evolving as the Web itself… but for communication.

As of June 2019, Matrix is out of beta, and the protocol is fully suitable
for production usage.

Messaging

Matrix gives you simple HTTP APIs and SDKs (iOS, Android, Web) to create chatrooms,
direct chats and chat bots, complete with end-to-end encryption, file transfer, synchronised
conversation history, formatted messages, read receipts and more.

Conversations are replicated over all the servers participating in them, meaning there are no
single point of control or failure. You can reach any other user in the global Matrix
ecosystem of over 40M users, even including those on other networks via bridges.

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while warning if any unexpected devices are added to the conversation.

Matrix's encryption is based on the Double Ratchet Algorithm popularised by Signal, but extended to support encryption to rooms containing thousands of devices. Olm and Megolm are specified as an open standard and implementations are released under the Apache license, independently audited by NCC Group.
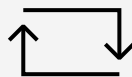
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VoIP

With the advent of WebRTC, developers gained the ability to exchange high quality voice and video calls – but no standard way to actually route the calls.

Matrix is the missing signalling layer for WebRTC. If you are building VoIP into your app, or want to expose your existing VoIP app to a wider audience, building on Matrix's SDKs and bridges should be a no-brainer.

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Bridging

Matrix owes its name to its ability to bridge existing platforms into a global open matrix of communication. Bridges are core to Matrix and designed to be as easy to write as possible,

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IOT, VR and more...

Matrix can handle any type of real-time data, not only messaging and VoIP.

By building bridges to as many IoT silos as possible, data can be securely published on the Matrix network. IoT solutions built on Matrix are unified, rather than locked to specific vendors, and can even publish or consume Matrix data directly from devices via ultra-low bandwidth transports (100bps or less)

Meanwhile AR and VR vendors are recreating the silos we've seen in instant messaging rather than working together towards an open ecosystem. Matrix can be the unifying layer for both communication and world data in AR and VR.

How does it work?

Matrix is really a **decentralised conversation store** rather than a messaging protocol. When you send a message in Matrix, it is replicated over all the servers whose users are participating in a given conversation - similarly to how commits are replicated between Git repositories. There is no single point of control or failure in a Matrix conversation which spans multiple servers: the act of communication with someone elsewhere in Matrix shares ownership of the conversation equally with them. Even if your server goes offline, the conversation can continue uninterrupted elsewhere until it returns.

This means that every server has total self-sovereignty over its users data - and anyone can choose or run their own server and participate in the wider Matrix network. This is how Matrix democratises control over communication.

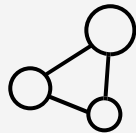By default, Matrix uses simple HTTPS+JSON APIs as its baseline transport, but also embraces

Next

An Open Standard

Simple pragmatic RESTful HTTP/JSON APIs by default
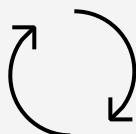
Open specification of the Matrix standard

Fully decentralised conversations with no single points of control or failure

End-to-end encryption via Olm and Megolm

WebRTC VoIP/Video calling using Matrix signalling

Integrates with existing 3rd party IDs to authenticate and discover users

Maintained by the non-profit Matrix.org Foundation

Group conversations, read receipts, typing notifications, presence...

Latest News

This Week in Matrix 2022-05-20

2022-05-20 by Thib

Synapse 1.59 released

2022-05-18 by Brendan Abolivier

Synapse 1.59 is out! Let's see what's new in this version. Generic worker types When Synapse instances are subject to high load, it can be...

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Independent public audit of Vodozemac, a native Rust reference implementation of Matrix end-to-end encryption

2022-05-16 by Matthew Hodgson

Hi all, It's been quite a while since our last independent E2EE review, and so we're incredibly proud to present an entirely new...

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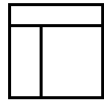
This Week in Matrix 2022-05-13

2022-05-13 by Thib

Matrix Live 🎙 Dept of Spec 🗒 Andrew Morgan (anoa) says Here's your weekly spec update! The heart of Matrix is the specification - and...
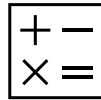
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SDKs

Native SDKs for multiple platforms, including:

| Python | JavaScript | Android | iOS |

View all SDKs

Open Source

Join thousands of other developers in our open source repositories, including:

Synapse   ⭘ Star 9,490

JavaScript SDK   ⭘ Star 1,026

Android SDK   ⭘ Star 349

The Matrix Foundation

Matrix is managed through an open governance process, looked after by The Matrix.org Foundation - a non-profit UK Community Interest Company.

It acts as a neutral guardian of the Matrix spec, nurturing and growing Matrix for the benefit of the whole ecosystem.

The Guardians are the legal directors of the Foundation, responsible for ensuring that it keeps on mission and neutrally protects the development of Matrix.

What people are saying

> I have seen the future of distributed collaboration and it is Matrix. The .NET binding looks old, incomplete and I maintained. If we get GSoC students this year, I'll be happy to mentor, in the meantime I should probably contribute to it: https://t.co/nJY4iNHaLQ
>
> — Miguel de Icaza (@migueldeicaza) February 6, 2019

> I finally started a spreadsheet to compare relative security, privacy, compatibility, and features of various messenger systems. TL;DR @RiotChat / @matrixdotorg is winning on all fronts. https://t.co/7zxczdjwwJ
>
> — Lance R. Vick (@lrvick) October 13, 2018

> I certainly wouldn't trust a proprietary software driven by some Russian crypto millionaires

We are spending more and more time in @matrixdotorg. @RiotChat works like a charm, better than @SlackHQ for many things and of course way better than IRC. It's awesome to have so many open communities forming and being able to jump from one channel to the other. Give it a try! 📢 pic.twitter.com/5uL1D4ryQo

— poliastro (@poliastro_py) March 5, 2019

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OmiseGO is a public Ethereum-based financial technology for use in mainstream digital wallets.

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