



Jabber/XMPP: 25 Jahre Digitale Souveränität

Warum Open Source ohne Föderation nicht reicht, was XMPP heute bietet und wie der Weg zu XMPP 2.0 aussieht

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- Offene Standards
 - IETF
 - XMPP Standards Foundation (XSF)
- Android-App-Entwickler
 - Conversations (Jabber/XMPP-Client)
 - Ltt.rs (E-Mail-Client)
 - UnifiedPush

These

Open Source ist notwendig, aber nicht hinreichend für digitale Souveränität.

Was Open Source leistet

- Schutz vor Spyware
- Verifizierbare Kryptografie
- Nachvollziehbarkeit des Codes

Was Open Source nicht leistet

- Schutz vor Dienstabstaltung
- Schutz vor Sanktionen
- Schutz vor regionalen Sperren (Kein Signal in Europa bei Chatkontrolle)
- Schutz vor Betreiberwillkür (TOS, „rug pull“, ...)

These

Echte Souveränität verlangt vollständige Austauschbarkeit.

- Austauschbarkeit des Serveranbieters (Provider)
 - Trotzdem mit anderen kommunizieren können
 - Federated Identities (user@example.com)
- Austauschbarkeit der Software
 - Client
 - Server
- **Jeder Akteur kann jederzeit ersetzt werden**

These

Eine öffentlich dokumentierte API ist noch kein offener Standard.

Standards Developing Organization (SDO)

- ISO, DIN, IETF, W3C
- IETF-Standards: DNS, HTTP, JSON, TLS 1.3, SSH
- Kein Standard: Simple Storage Service (S3)
- **Breiter Konsens zwischen unabhängigen Akteuren**

Extensible Messaging and Presence Protocol (XMPP)

RFC 6120 & RFC 6121



- RFC 3920, RFC 3921 (October 2004)
- RFC 6120, RFC 6121 (March 2011)
- Erweiterungen ⇒ XMPP Standards Foundation (XSF)
- XSF: Council und Board gewählt
- Regeln gegen Übermacht einer Firma
- Anpassungsfähigkeit
- 518 Erweiterungen. 142 Stable, Final, Active

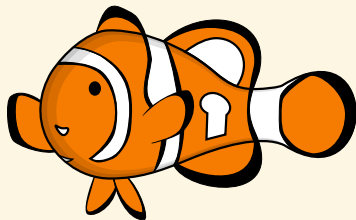
2014 - 2016

Sprung ins mobile Zeitalter

- XEP-0198: Stream Management
 - Pakete (Nachrichten, ...) werden vom Server einzeln bestätigt
 - Fortsetzung nach Verbindungswechsel
- XEP-0352: Client State Indication

Unterstützung für mehrere Geräte

- Nachrichten an alle Geräte (XEP-0280: Message Carbons)
- Offline-Nachrichten (XEP-0313: Message Archive Management)
- Dateiversand an mehrere (offline) Geräte (XEP-0363: HTTP File Upload)
- P2P-Dateiversand weiterhin möglich



- XEP-0384: OMEMO Encryption
- „Signal-Verschlüsselung“ (WhatsApp, Google Duo, ...)
- Verschlüsselt Text und Dateien
- Mehrere Geräte

Status quo

Feature-Highlights der jüngeren Geschichte

Extensible SASL Profile (SASL2), Bind 2 und FAST

- Direct TLS
- Angemeldet und komplett verbunden in einem Roundtrip
- Hashed Token statt SCRAM (IETF Kitten WG)
- Breite Adoption im Ökosystem
(Prosody, ejabberd, Openfire, MongooselM, Tigase¹)

¹kein Hashed Token

Channel Binding

Encrypted traffic interception on Hetzner and Linode targeting the largest Russian XMPP (Jabber) messaging service

WABNDZ 3rd November 2023 at 9:17pm

TL;DR: we have discovered XMPP (Jabber) instant messaging protocol encrypted TLS connection wrapping (Man-in-the-Middle attack) of jabber.ru (aka.xmpp.ru) service's servers on Hetzner and Linode hosting providers in Germany. The attacker has issued several new TLS certificates using Let's Encrypt service which were used to hijack encrypted STARTTLS connections on port 5222 using transparent MTM proxy. The attack was discovered due to expiration of one of the MTM certificates, which haven't been renewed. There are no indications of the server breach or spoofing attacks on the network segment, quite the contrary: the traffic redirection has been configured on the hosting provider network.

The wiretapping may have lasted for up to 6 months overall (90 days confirmed). We believe this lawful interception Hetzner and Linode were forced to setup.

Last update: 03 Nov 2023

Introduction

`@rpa`, experienced UNIX administrator who is in charge for the oldest Russian XMPP service `jabber.ru` established in year 2000, was puzzled by "Certificate has expired" message upon connecting to the service on 16 October 2023. All the certificates seemed to be up-to-date on the server, but the connection to port 5222 (XMPP STARTTLS) was presenting an outdated certificate to the client.

During all kinds of software, network and configuration checks with the help of other professionals and `ejabberd` software author, it was discovered that:

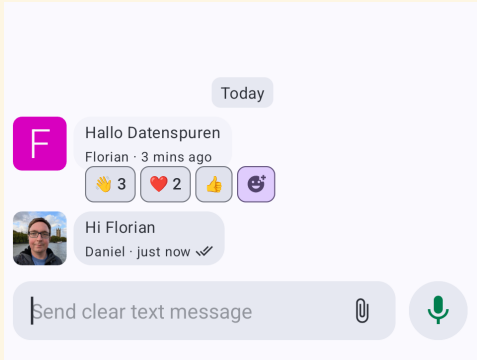
- The software serves proper, non-expired certificate in the network traffic
- The expired certificate is not present on the server
- It is based on other private key and was never issued by the server's `acme.sh` certificate issuing script
- Incoming TCP connections to port 5222 are altered: they have different source port, SEQ/ACK numbers, and appear to arrive without any intermediate routing hops (TTL=64)
- This behavior is not observed on other, non-5222 ports, such as 5223 XMPP TLS port

The affected machines are dedicated server on Hetzner and two virtual servers on Linode, all hosted in Germany.

The figure displays two side-by-side Wireshark packet capture windows. The left window, titled 'Wireshark - Packet #1', shows a packet from 172.184.234.182 to 172.184.234.182 on port 5222, labeled 'CLIENT'. The right window, titled 'Wireshark - Packet #2', shows a packet from 172.184.234.182 to 172.184.234.182 on port 5222, labeled 'SERVER'. Both packets are TLSv1.2 and show a 'Server Key Exchange' message. The packet details pane on the right of each window shows the following structure:

- Frame 1: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 95.215.45.33
- Frame 2: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 3: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 4: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 5: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 6: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 7: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 8: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 9: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 10: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 11: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 12: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 13: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 14: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 15: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
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- Frame 18: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
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- Frame 28: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
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- Frame 184: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 185: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 186: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
- Frame 187: 172.184.234.182 → 172.184.234.182 [TCP] Seq= 172.184.234.182
-

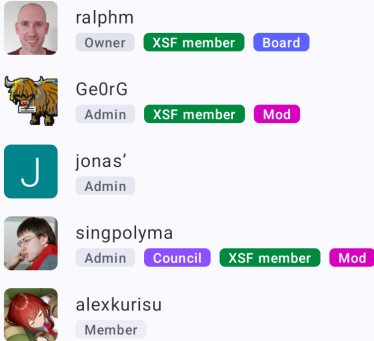
Emoji Reactions



- XEP-0444: Message Reactions
- Conversations, converse.js, Gajim, Dino, Movim, poezio, Psi

- XEP-0425: Moderated Message Retraction
- Spambekämpfung in “public channels”
- Braucht Serverunterstützung
- Ban + lösche alle Nachrichten in einem Schritt (clientseitig)

Hats



A screenshot of a user list from a community platform. Each entry consists of a profile picture, a username, and a row of role tags. The roles are color-coded: grey for basic roles (Owner, Admin, Member), green for 'XSF member', purple for 'Board' or 'Council', and pink for 'Mod'.

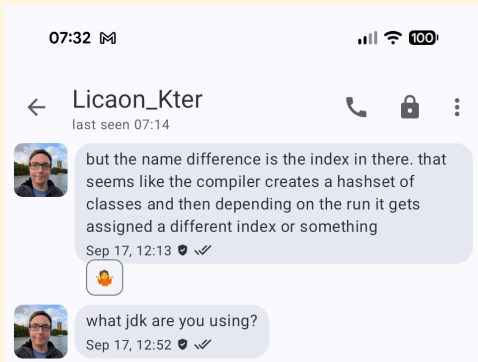
Profile Picture	Username	Roles
	ralphm	Owner, XSF member, Board
	Ge0rG	Admin, XSF member, Mod
	jonas'	Admin
	singpolyma	Admin, Council, XSF member, Mod
	alexkurisu	Member

- XEP-0317: Hats
- „Rollen“ (nicht technisch) in einer Organisation

Multi-Device-Sync des Gelesen-Status

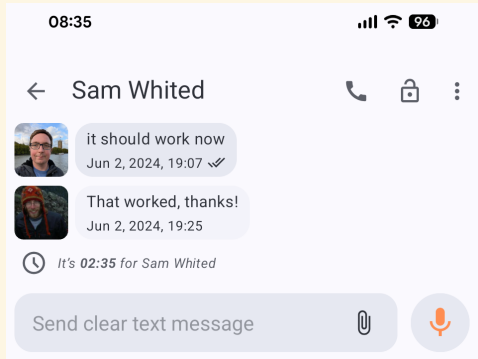
- XEP-0333: Displayed Markers
 - Lässt Kontakt(e) wissen, dass eine Nachricht gelesen wurde
 - Lässt sich (aus Datenschutzgründen) abstellen
 - In großen Gruppen häufig deaktiviert
- XEP-0490: Message Displayed Synchronization

Zuletzt gesehen



- XEP-0319: Last User Interaction in Presence
- Gajim, converse.js, Monal, Conversations, Movim, poezio
- „off by default“ in Conversations

Zeitzonen-Anzeige von Kontakten



- XEP-0202: Entity Time, März 2007
- Antworten auf Anfragen wird breit unterstützt.
- Neue Art der Darstellung seit 2025

Implementierungen

Software Specifications Community Getting Started News Jobs

no event found

New XEPs

[XEP-0318 Payment Required](#)
[XEP-0317 Single Synchronized Real-Time Text](#)
[XEP-0316 XMPP Decentralized ID \(XDI\)](#)
[XEP-0315 TLS Channel-Binding Downgrade Protection](#)
[XEP-0314 Error Markup](#)

Recently Updated XEPs

[XEP-0315 TLS Channel-Binding Downgrade Protection](#)
[XEP-0318 Payment Required](#)
[XEP-0034 User Avatar](#)
[XEP-0040 Message Displayed Synchronization](#)
[XEP-0066 Out of Band Data](#)

The whole list

The XMPP Standards Foundation develops extensions to XMPP in its XEP series. This page lists Stable and Final XEPs as well as experimental proposals that are currently under consideration.

XEP series data can be explored using [data.xmpp.net/explore](#).

Good places for developers to start are the [compliance suites](#), as well as the [technology overview pages](#). For further reading, we suggest the independent [Modern XMPP project](#) which attempts to improve the quality of user-to-user messaging applications that use XMPP.

The following table is sortable, just click on the headers (click twice to reverse the sort order). You can show/hide the various types of XEPs by applying filters via the Filter button below.

Search by number, name, short name or tag...

Filter XEPs

Filter XEPs

Only checked types will be shown

☐ Proposed ☒ Stable ☒ Final ☐ Active

☐ Deprecated ☐ Obsolete ☐ Rejected ☐ Retracted

☐ Experimental ☐ Deferred ☒ Dormant

☐ Dormant XEPs in Experimental/Deferred are hidden. Check Dormant to show all Experimental/Deferred XEPs.

Showing 91 of 518 XEPs (2 filters active)

Number	Name	Type	Status	Date	Tags	Implementations
XEP-0004	Data Forms (x-data)	Standards Track	Final	2004-08-20		46
XEP-0009	Jabber-RPC (xmpp-rpc)	Standards Track	Final	2007-09-04		6
XEP-0012	Last Activity (x-last)	Standards Track	Final	2008-11-26		20
XEP-0030	Service Discovery (x-service)	Standards Track	Final	2004-04-30		93
XEP-0033	Extended Stanza Addressing (x-addr)	Standards Track	Stable	2007-05-15		10
XEP-0045	Multi-User Chat (x-muc)	Standards Track	Stable	2006-06-05		93

XEP-0030: Service Discovery

Last XEP revision: Version 2.5.0 (2024-08-30)

Name	Status	Since Version	XEP Version
Artalk.Xmpp	✓	2.0.0	2.5.0
AstraChat XMPP Client	-	-	-
AstraChat XMPP Server	-	-	-
afalk	✓	0.5.8	2.5.0
Beagle IM	✓	-	2.5x3
Bruce	✓	-	2.5x3
Cheogram Android	✓	-	2.5x3
Conversations	✓	-	2.5x3
Converse.js	✓	0.8.2	-
CoyIM	✓	-	-
cz-xmpp	✓	-	-
Dino	✓	01	-
egabberd	✓	01.0	2.5.0
ElangElkor XMPP	-	-	2.5.0
Ethara	✓	-	-
Fluxus Messenger	✓	-	-
Gajim	✓	-	2.4
Hatizen	✓	-	2.5x3
Jabber.al	✓	-	2.5.0
JaxXMPP	✓	-	2.5x3
Kalder	✓	0.2	2.4
Likewise	✓	-	2.5.0
Martin	✓	-	2.5x3
Metronome IM	✓	-	2.4
Moranda NG	-	-	-
Murai IM	✓	4.6	2.5.0
MongooseIM	✓	-	2.5.0
monocles chat	✓	-	2.5x3
Moovin	✓	-	2.5
moosmpp	✓	-	2.5x3
Moxy	✓	-	2.5x3

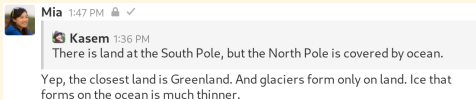
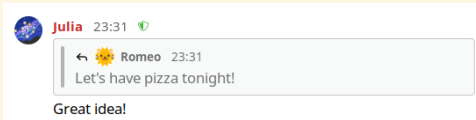
xmpp.org/extensions

Ausblick

Kommende Protokoll-Entwicklungen

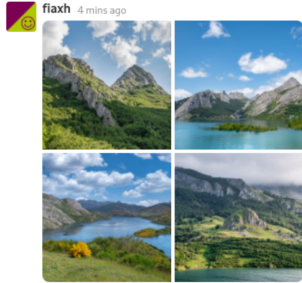
- XEP-0420: Stanza Content Encryption
- Spezifizierte Double Ratchet (was: use libsignal-protocol)
- Robuster. 10 Jahre Erfahrung mit OMEMO

Message Replies



- XEP-0461: Message Replies
- Gajim, Dino, Movim, converse.js

Galerie / Multi-Image-Sharing



- XEP-0447: Stateless file sharing
- Mit Thumbnails
- Setzt OMEMO 2 voraus

OAuth-Integration



- Anmelden im Webclient
- Zentrale Nutzerverwaltung (Keycloak)
- XMPP Sprint London, November 2026

XMPP 2.0

Zurück zur IETF



- Core-RFC aktualisieren
(Verbindung sieht komplett anders aus)
- Populäre XEPs zusammenfassen
- Side Meeting IETF 126 Vienna
- BoF IETF 128 Kuala Lumpur
(non-working group forming?)

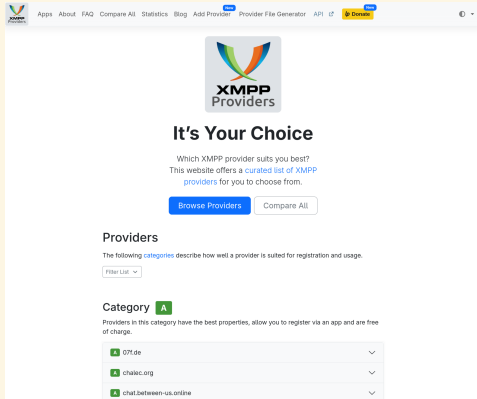
Ausprobieren

Clients, Provider, selber hosten

Clients

- Linux ⇒ Dino (oder Gajim)
- Windows ⇒ Gajim
- Android ⇒ Conversations
- iPhone ⇒ Monal

Provider



The screenshot shows the homepage of the XMPP Providers website. The header includes a navigation menu with links: Apps, About, FAQ, Compare All, Statistics, Blog, Add Provider, Provider File Generator, API, and a Contact button. The main content area features the XMPP Providers logo, a heading "It's Your Choice", and a paragraph asking which XMPP provider suits the user best, offering a curated list of providers. Below this are two buttons: "Browse Providers" and "Compare All". The "Providers" section explains that the following categories describe how well a provider is suited for registration and usage, with a "Filter List" dropdown. The "Category A" section lists providers with the best properties, allowing registration via an app and being free of charge. The listed providers are 071.de, chalc.org, and chat.between-us.online.

XMPP Providers

Apps About FAQ Compare All Statistics Blog Add Provider Provider File Generator API [Contact](#)

It's Your Choice

Which XMPP provider suits you best?
This website offers a [curated list of XMPP providers](#) for you to choose from.

[Browse Providers](#) [Compare All](#)

Providers

The following [categories](#) describe how well a provider is suited for registration and usage.

[Filter List](#) ▾

Category **A**

Providers in this category have the best properties, allow you to register via an app and are free of charge.

071.de	▾
chalc.org	▾
chat.between-us.online	▾

- conversations.im (In-Band-Registrierung)
- providers.xmpp.net
- Hackspace

- Prosody
- ejabberd

Fragen?

joinjabber.org · xmpp.org