

# Jabber, the Real-Time Internet, and You

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# About Me

- Executive Director, XMPP Standards Foundation <<http://xmpp.org/>>
- Maintainer, Jabber community <<http://www.jabber.org/>>
- Editor, XMPP RFCs
- Author, ~50 XMPP extensions
- Blogging at <<https://stpeter.im/>>

# Message + Reply, London to Calcutta

- 1800: 2 years (sailing ship)
- 1914: 1 month (steamship)
- 1950: 1 week (air mail)
- 1980: 2 days (overnight mail)
- 1993: 10 minutes (commercial email)
- 1999: 1 second (instant messaging)

# What it Means

- The half-life of information is shrinking
- We need to build a more real-time Internet
- We need to deliver information just-in-time, when and where it is needed
- We need to know when people, devices, and applications are online (“presence”)

# Why Presence?

- A dial-tone for the real-time Internet
- A catalyst for communication
- Basic: network availability
- Advanced: identity, activity, mood, location, capabilities, etc.
- Not just people, also devices & applications

# What is Jabber?

- A set of open XML technologies for..
- Real-time messaging
- Presence
- Multimedia negotiation
- Structured information exchange
- And more...

# Jabber Technologies

- Extensible: streaming XML over TCP
- Open: not patent-encumbered, many open-source implementations
- Standard: formalized via IETF as XMPP (Extensible Messaging & Presence Protocol)
- Secure: TLS/SSL, SASL authentication, etc.
- Decentralized: domain-based routing

# Jabber History

- 1999: initial release by Jeremie Miller
- 2000: core technology stable
- 2001: Jabber Software Foundation
- 2004: XMPP RFCs published
- 2005: Google Talk service
- 2006: XMPP on DoD standards registry

# Technology Ecosystem

- Multiple server codebases
- IM clients for every platform
- Code libraries for every language
- Open, standard protocols
- No license restrictions (open source, commercial, freeware, shareware, etc.)

# Distributed Network

- Client-server architecture
- Inter-domain messaging (like email)
- 50+ million end users
- 100k+ deployed servers
- All numbers are approximate -- how many email users/servers are there?

# Serious Deployment

- Services: Google Talk, Live Journal, GMX, NTT, Portugal Telecom, BellSouth, etc.
- Enterprises: HP, EDS, FedEx, Oracle, Sun, most Wall Street banks, etc.
- Government: DISA approved, SIPRnet, etc.
- Universities: MIT, Penn, Duke, Wisconsin, etc.
- Web 2.0: Twitter, Jaiku, Joost, OLPC, etc.

# Developer Freedom

- Run your own server
- Write your own components
- Integrate with existing systems
- Mix and match open-source & commercial
- Design your own extensions (it's just XML)
- Build your own real-time applications

# Interoperability?

- Core protocols defined in RFCs: XML streaming, security, messaging, presence
- XMPP extensions (XEP series) defined by XMPP Standards Foundation
- Strong commitment to interoperability and common standards in developer community
- No vendor lock-in!

# What You Get

- Jabber server = XML router + presence engine
- Application server for the real-time Internet
- Much more than just IM
- Extensibility via XML
- [insert your XML format here]

# Basic Applications

- IM and group chat
- Just teen chat, right? Wrong!
- Trading desks on Wall Street
- Incident rooms among first responders
- Chat rooms for military comms
- Expert support (e.g., [qunu.com](http://qunu.com))

# Consumer Applications

- Shared browsing (e.g., me.dium)
- Gaming (e.g., ChessPark)
- Micro-blogging / RSS+Atom notifications (Twitter, Jaiku, etc.)
- Whiteboarding (Inkscape, etc.)
- IPTV (Joost)

# Enterprise Applications

- Financial modeling (RSS to spreadsheet cells)
- Geolocation (e.g., trakm8)
- Workflow processing / supply chain management (e.g., Reynolds & Reynolds)
- Energy trading (e.g., Netenergy)
- Network management (e.g., Oracom)
- Collaborative data objects

# Multimedia Applications

- Negotiate session parameters via XMPP
- Exchange media out of band
- Google Talk / Jingle
- Nokia 770/800, OLPC, FreeSwitch, etc.
- Asterisk federation

# How It Works

- Client opens XML stream to server via TCP on port 5222
- Client authenticates with server
- Client sends unlimited number of XML “stanzas”
- Server may open streams to other servers for dynamic inter-domain federation

# Smart Connections

- HTTP “streaming” method similar to Comet model (no long-lived TCP connection)
- Link-local messaging via zero-configuration networking (Apple Bonjour, OLPC)
- Stream compression results in significant bandwidth savings (up to 90%)

# Security

- Transport Layer Security (TLS) for channel encryption
- Simple Authentication & Security Layer (SASL) for authentication (DIGEST-MD5, Kerberos, X.509 certificates, etc.)
- Server dialback to discourage address spoofing, server certs for strong identity
- S/MIME or PGP for end-to-end encryption

# Look Ma, No Spam

- Domain spoofing is difficult
- Pure XML not friendly to malware
- XHTML subset (no scripts or images)
- Preventive measures defined if spam appears
- Exploring reputation system for servers

# Internationalization

- Full Unicode addresses -- not limited to ASCII
- All XML traffic is UTF-8 encoded
- Multiple languages via `xml:lang`
- Real-time translation protocol under development (US JFCOM)

# Group Chat

- Chat rooms -- similar to IRC channels
- Room acts as reflector for message and presence traffic
- Defined in XEP-0045
- Very popular in financial and military deployments
- Working on distributed rooms

# Service Discovery

- Easy to locate services on the network (XEP-0030)
- No “crawlers” or directory services yet, but needed
- Dynamic capabilities discovery and notification via presence (XEP-0115)

# Personal Eventing

- Ability to use IM account as locus for notifications
- Any XML payload: activity, location, mood, tune, gaming, browsing, blogging, etc.
- Generalized publish-subscribe services for people, devices, and applications (XEP-0060)
- Real-time RSS and Atom feeds

# Jingle

- Flexible framework for management of multimedia sessions (XEP-0166)
- Signalling via XMPP, media out of band
- Pluggable transports (ICE-UDP, ICE-TCP, direct UDP, etc.)
- Pluggable media types (voice, video, file sharing, etc.)

# Current Focus

- RFC revisions
- Finalizing Jingle for VoIP
- Wide deployment of personal eventing
- Shared XML editing / whiteboarding
- Further spam prevention techniques
- Improved security (end-to-end encryption)

# Get Started

- Download a client
- Create a free account
- Run your own server
- Connect to the network (or not!)
- Build real-time applications

# Why XMPP Matters

- Freedom of conversation
- Not proprietary technologies
- Open IETF/XSF standards
- Innovate at the edges
- Build competitive advantage
- Build the real-time Internet

# Join the Conversation

- Active developer community  
<<http://planet.jabber.org/>>
- Lots of open-source projects  
<<http://www.jabber.org/>>
- Developer-friendly standards process  
<<http://www.xmpp.org/>>
- Contact me directly  
<<http://stpeter.im/>>