Build the realtime web with XMPP and Wave

Collaborating in realtime on the web

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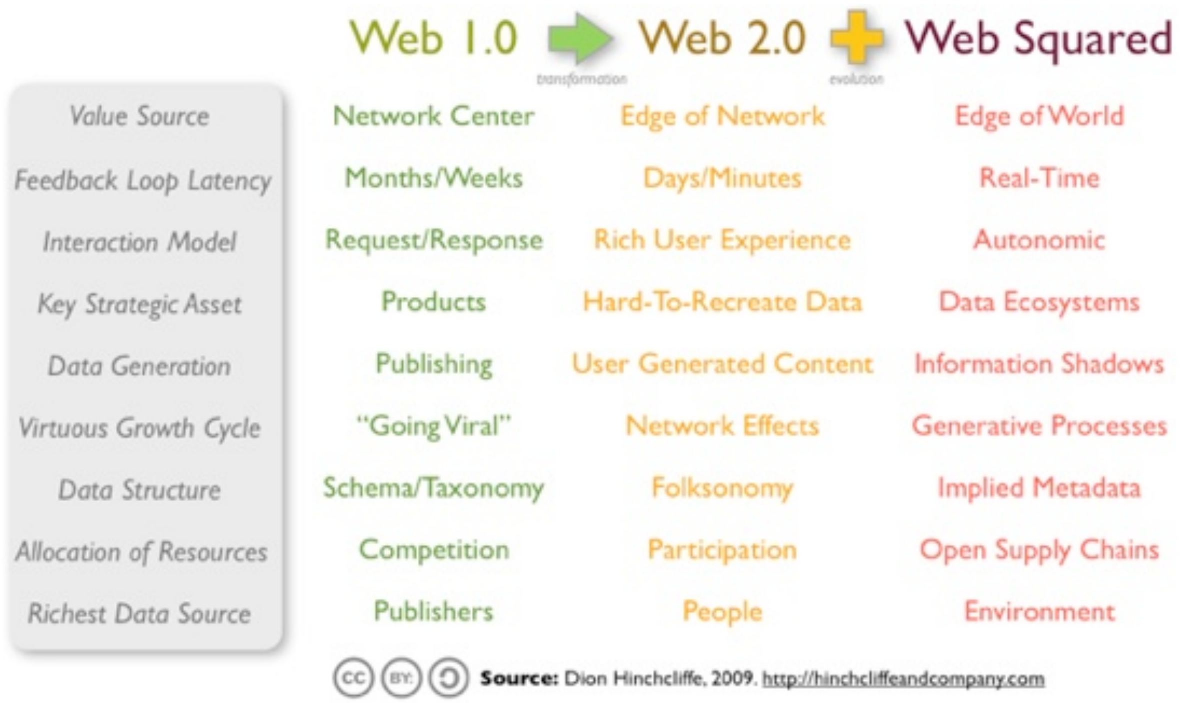
Building the real time web: Initial problem

Realtime web: A natural trend of the web

Web 3.0 or Web² : real-time platform for data & events

Web 2.0 : platform for persons

Web 1.0 : platform for info & documents



	Web 1.0	Web 2.0	Web Squared
Value Source	Network Center	Edge of Network	Edge of World
Feedback Loop Latency	Months/Weeks	Days/Minutes	Real-Time
Interaction Model	Request/Response	Rich User Experience	Autonomic
Key Strategic Asset	Products	Hard-To-Recreate Data	Data Ecosystems
Data Generation	Publishing	User Generated Content	Information Shadows
Virtuous Growth Cycle	"Going Viral"	Network Effects	Generative Processes
Data Structure	Schema/Taxonomy	Folksonomy	Implied Metadata
Allocation of Resources	Competition	Participation	Open Supply Chains
Richest Data Source	Publishers	People	Environment

Source: Dion Hinchcliffe, 2009. http://hinchcliffeandcompany.com

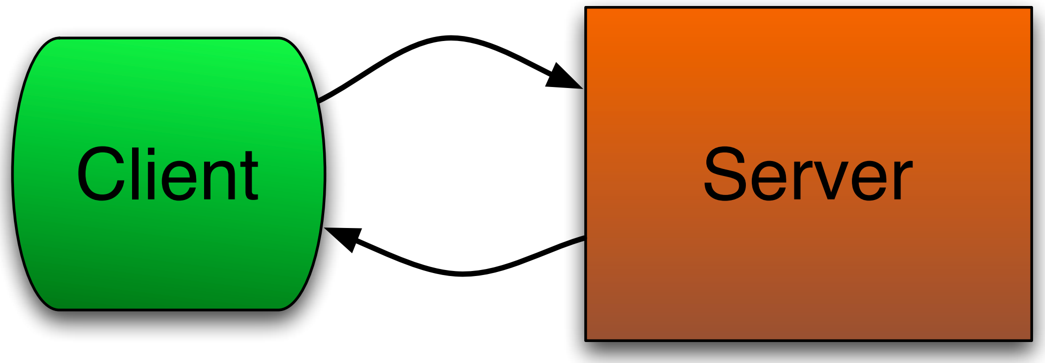
Build with inadequate technologies

- **Inadequate** technologies have been used for that.
- HTTP is **ubiquitous** so it has been used as a basis.
- **request and response** paradigm, not adequate for **push**
  - Push is the basis of realtime web:
    - = distribution of event coming from the server or another client.
- **AJAX** has been invented to **simulate push**, but it is a hack on a technology which is not adequate.

- Most services that claim to be real time are not trully real time.
- Example Twitter:
  - No push: polling based. A client need to send requests frequently to the server to check if there is new content.
  - Event received are most of the time delayed.

HTTP limitations

- Request and response mechanism.
- AJAX work around add an overhead with lots of HTTP headers.
- Lack of addressing scheme: You cannot address a user: You cannot only send content back to an HTTP connection.
- Architecture simple but not very flexible:



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XMPP: emerging solution for realtime user interactions

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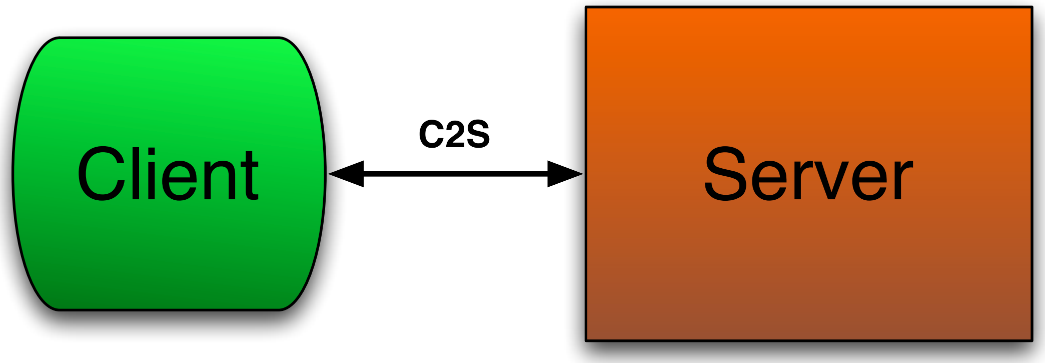
Emerging protocol for realtime web: XMPP

- XMPP = eXtensible Messaging and Presence Protocol
  - Protocol is formerly know as Jabber
  - **IETF** standard
- **Connected protocol** relying on a session. It means you can send but also receive information seamlessly.
- **Addressing scheme**: Each user can be reached by a message from any point in the network with his unique ID: JID.
- **Federated**: It means you can send information across services and across users through servers.
- It supports realtime message distributions that can covers the full scope of need to build realtime web:
  - Can optionally use **HTTP** as transport layer (Bosh).
  - Can use sophisticated and flexible **event distribution** mecanism (pubsub).
  - Can support all types of devices including **mobile**.
  - Can support **flexible** architecture.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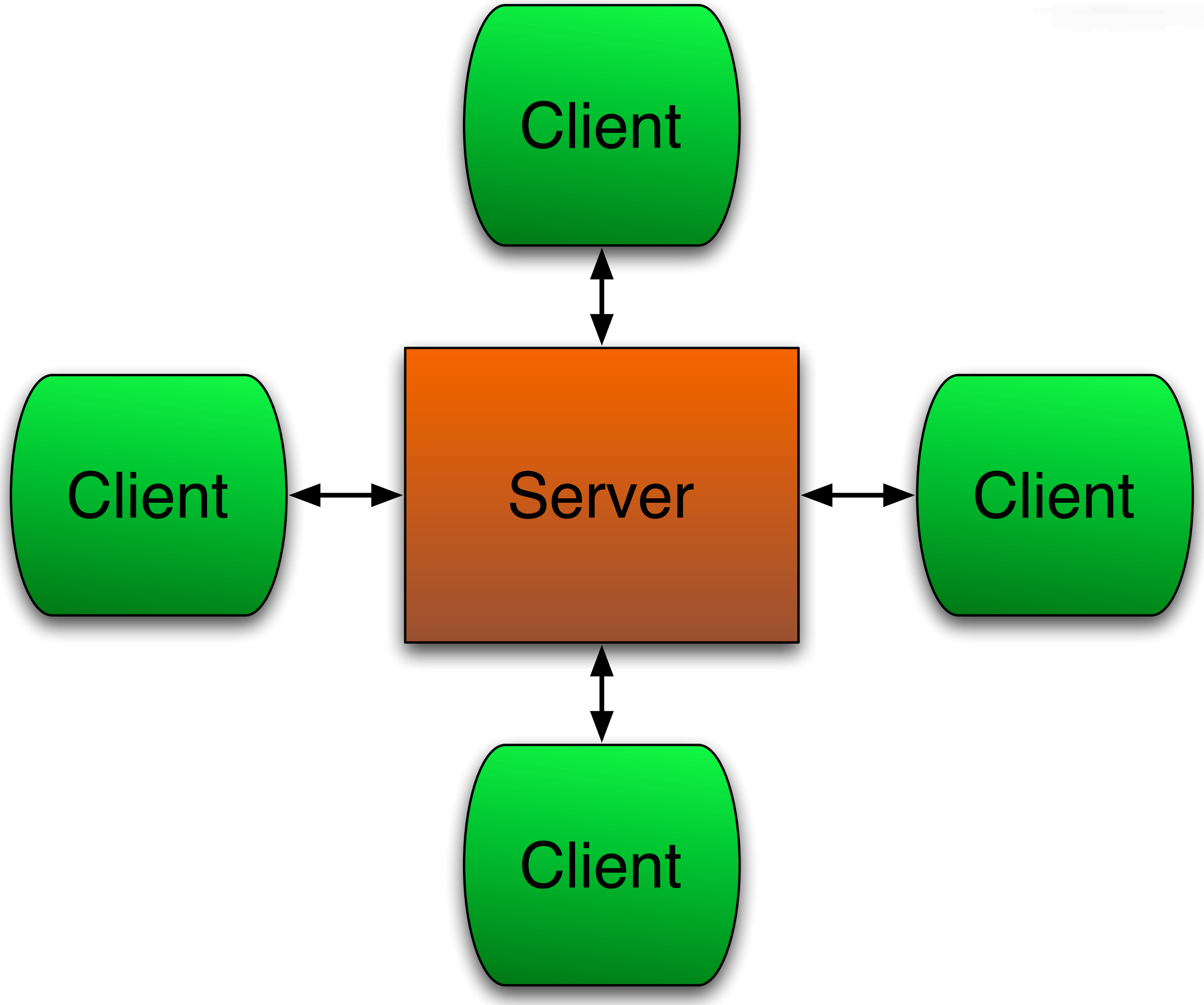
C2S
Server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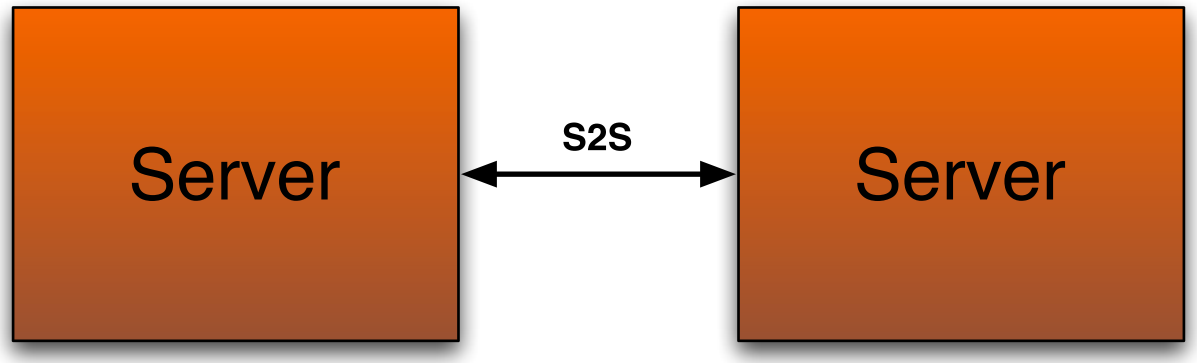
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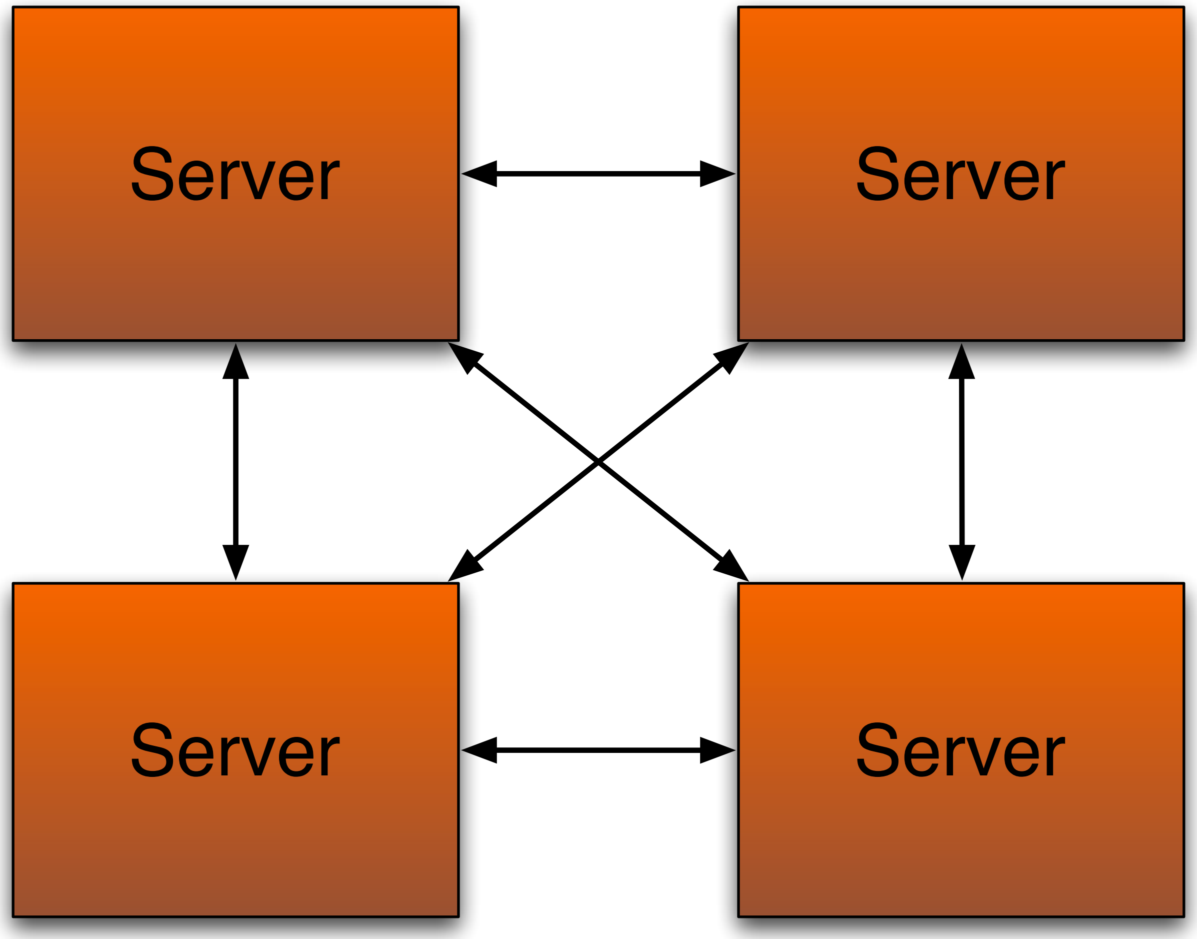
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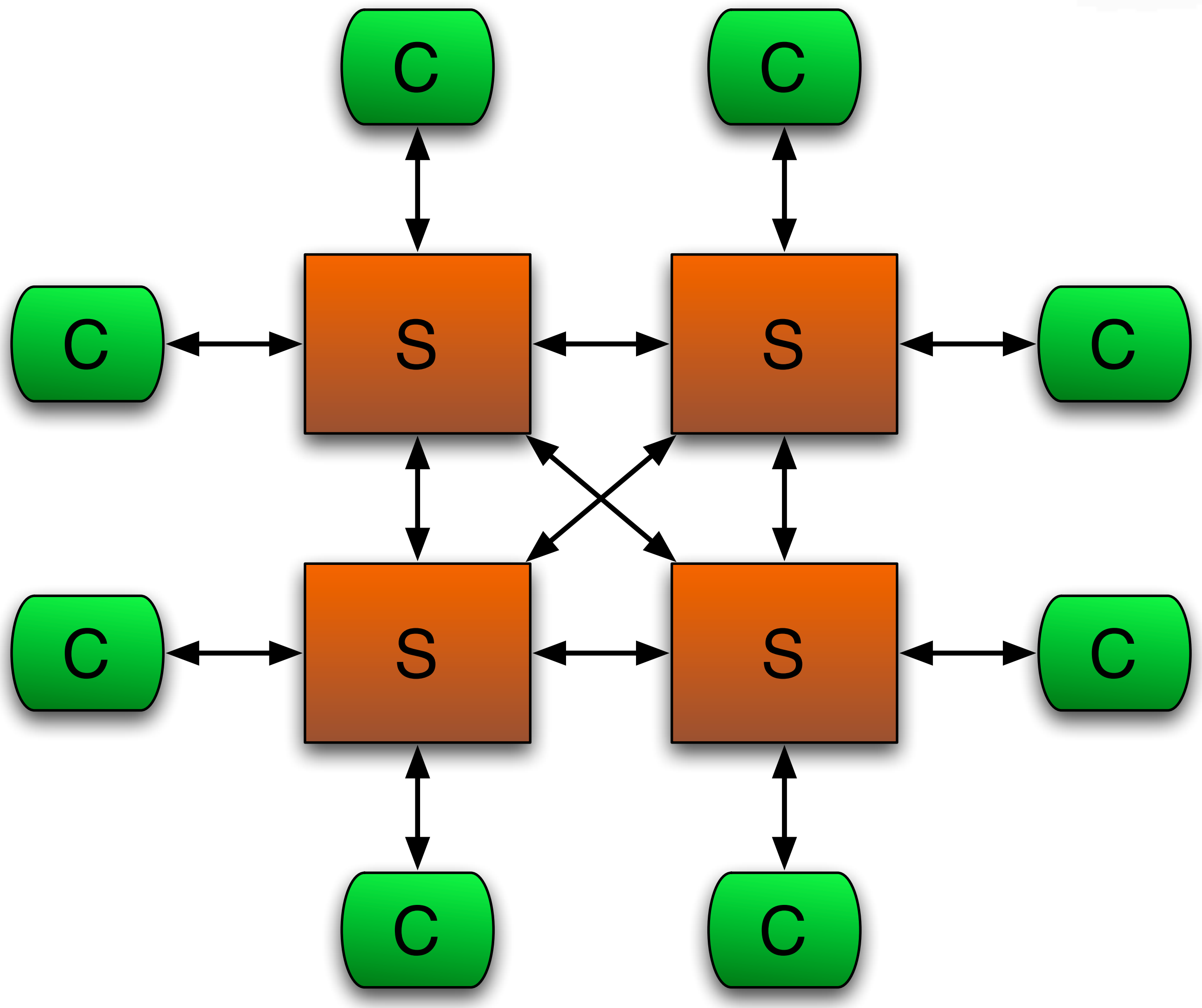
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Demonstrating the power of XMPP for real time web

- **Collecta**: it is transforming Twitter and other social networking publication into true real time events.
- **Chesspark**: Play chess over XMPP in the browser.
- **Wordpress**: Distribute blog post in real time over XMPP.
- **BBC**: Live distribution of radio program in real time.
- **OneWeb**: Browser interaction tool. Control your browser and share bookmark in real time -> Demo.
- In all cases, the technology used is XMPP and pubsub. Oneweb also uses adhoc commands. Chesspark uses groupchat (multi user chat rooms).

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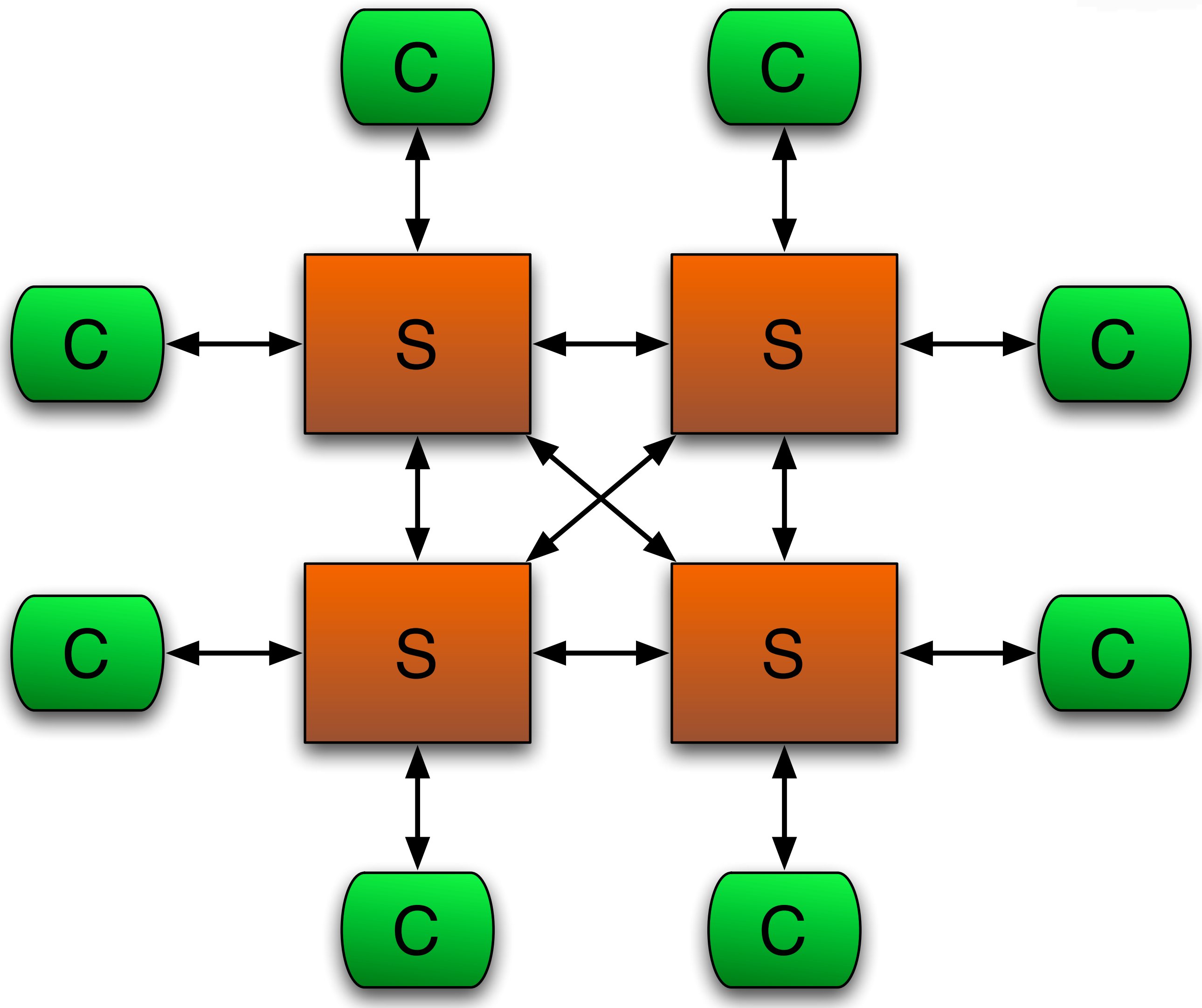
Google Wave: emerging solution for realtime user interactions

What is Wave ?

- A Wave is a real-time social web **object**.
- This « Webject » is a social element that can be **dynamically shared & embedded** with any web services like blogs, wikis, … in real time. Reply, archive, edit and add are available at any point in time in the process.
- **Versioning**: The playback function lets anyone rewind the Webject to see who waveleted, blipped what and when. all history is kept.
- A blended mix of Wave **extensions** : gadgets (run an app), robots (run smart-automated conversation participant), that could be accessed within Wave Inbox.
- **Federation**: There is no central server. You can use your own wave server, participate and invite people to wavelet on your server. Federation is based on XMPP.
- **Open** protocol: People are encouraged to implement their own client and server.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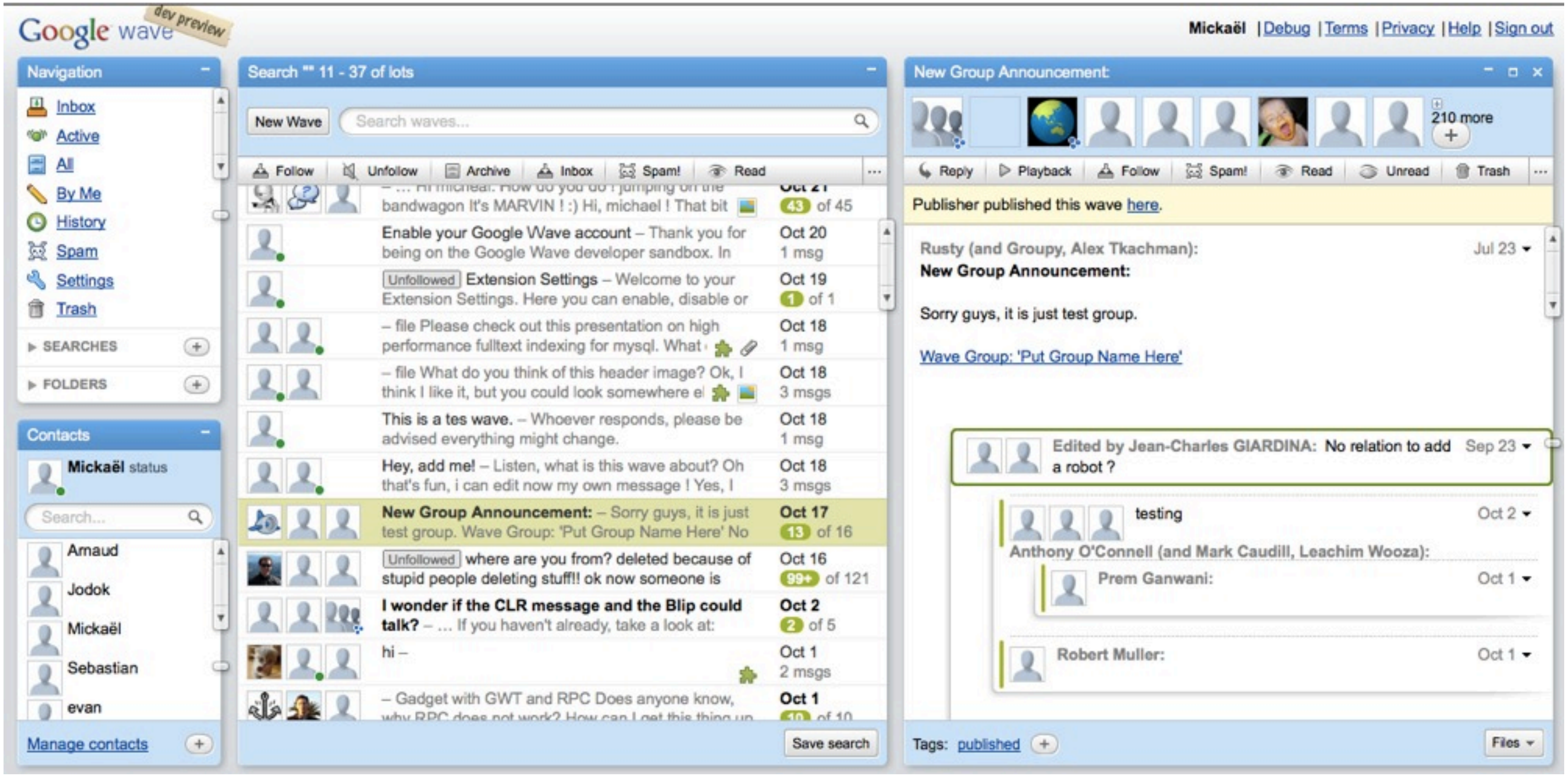
Wave client by Google



Mickaël status

Arnaud
Jodok
Mickaël
Sebastian
evan

– ... Hi michael. How do you do ! jumping on the bandwagon It's MARVIN ! :) Hi, michael ! That bit	Oct 21	43 of 45
Enable your Google Wave account – Thank you for being on the Google Wave developer sandbox. In	Oct 20	1 msg
Unfollowed Extension Settings – Welcome to your Extension Settings. Here you can enable, disable or	Oct 19	1 of 1
– file Please check out this presentation on high performance fulltext indexing for mysql. What	Oct 18	1 msg
– file What do you think of this header image? Ok, I think I like it, but you could look somewhere el	Oct 18	3 msgs
This is a tes wave. – Whoever responds, please be advised everything might change.	Oct 18	1 msg
Hey, add me! – Listen, what is this wave about? Oh that's fun, i can edit now my own message ! Yes, I	Oct 18	3 msgs
New Group Announcement: – Sorry guys, it is just test group. Wave Group: 'Put Group Name Here' No	**Oct 17**	13 of 16
Unfollowed where are you from? deleted because of stupid people deleting stuff!! ok now someone is	Oct 16	99+ of 121
I wonder if the CLR message and the Blip could talk? – ... If you haven't already, take a look at:	**Oct 2**	2 of 5
hi –	Oct 1	2 msgs
– Gadget with GWT and RPC Does anyone know, why RPC does not work? How can I get this thing up	**Oct 1**	10 of 10

Publisher published this wave here.

Rusty (and Groupy, Alex Tkachman): Jul 23
New Group Announcement:

Sorry guys, it is just test group.

Wave Group: 'Put Group Name Here'

Edited by Jean-Charles GIARDINA: No relation to add a robot ? Sep 23

testing Oct 2

Anthony O'Connell (and Mark Caudill, Leachim Wooza):

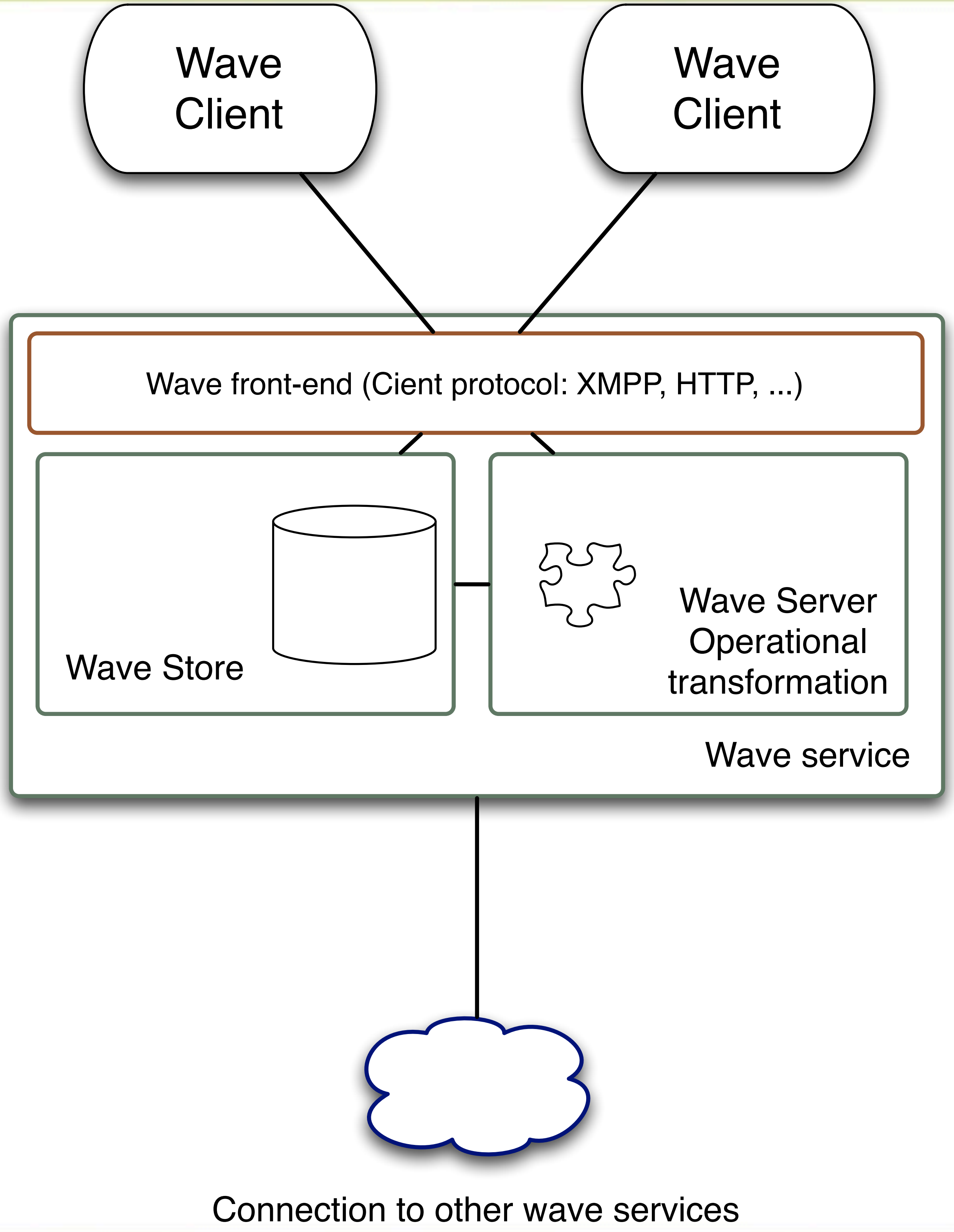
Prem Ganwani: Oct 1

Robert Muller: Oct 1

Terminology

- **Wave**: a collection of wavelets
- **Wavelet**: a collection of named documents and participants, and the domain of operational transformation. Operational transformation is the mathematical model that allows merging concurrent changes.
- **Blip**: Conversational message
- **Conversation model**: «document format»

How it works ?


Wave Client
Wave Client
Wave front-end (Cient protocol: XMPP, HTTP, ...)
Wave Store
Wave Server Operational transformation
Wave service
Connection to other wave services

The protocols used in Wave

Low level wave Protocol	– Protocol Buffer (protobuf)
Federation Protocol	– XMPP
Robot Protocol	– JSON
Client-Server Protocol	– As defined by the GWT but can be XMPP as well.
Gadget API	– OpenSocial
Wave Embedded API	– Javascript

Difference with XMPP pubsub

- The two technologies looks similar:
  - They are built to distribute events to several participant at the same time
  - They are based on XMPP

- But they have major differences:
  - The core of wave protocol is protobuf (binary) whereas pubsub is XMPP (XML).
  - Wave is XMPP as one of the possible transport for client and only transport for federation.
  - Pubsub is made to distribute events
  - Wave is made to edit a common shared memory space. Distributed events is a side effect.

- Wave and XMPP complete each other because they have different goals.

What is still missing ?

- Wave is still a **work in progress** by the community.
- True client protocol
  - Google Wave client use their own custom protocol (but XMPP can be used)
- Better integration with the XMPP protocol.
- More usage examples.
- Better ecosystem: Bots, Widget, Server and client.

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ProcessOne Wave server

- Already implemented for running a wave service:
  - Wave **store**
  - Wave **server** (Operational transform)
  - ejabberd **XMPP** server plugin to run Wave server
  - Client **protocol** over XMPP
  - Federation with servers like the fedone example implementation proposed by Google.
  - Federation with Google Wave.

- Preliminary **demo** with TKabber XMPP client.

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The end

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Useful Links

- XMPP: xmpp.org
- Wave:
  - wave.google.com
  - www.waveprotocol.org
- ProcessOne: www.process-one.net
- OneWeb: http://tinyurl.com/p1-oneweb