

Reverse-Ajax

Par Mathieu Carbou, le 17 avril 2011



Samples à <https://github.com/Ovea/conf-reverse-ajax>

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Reverse Ajax refers to an Ajax design pattern that uses **long-lived HTTP connections** to enable **low-latency** communication between a web server and a browser. Basically it is a way of sending data from client to server and a mechanism for **pushing server data back to the browser**.

Event-Driven Web Applications

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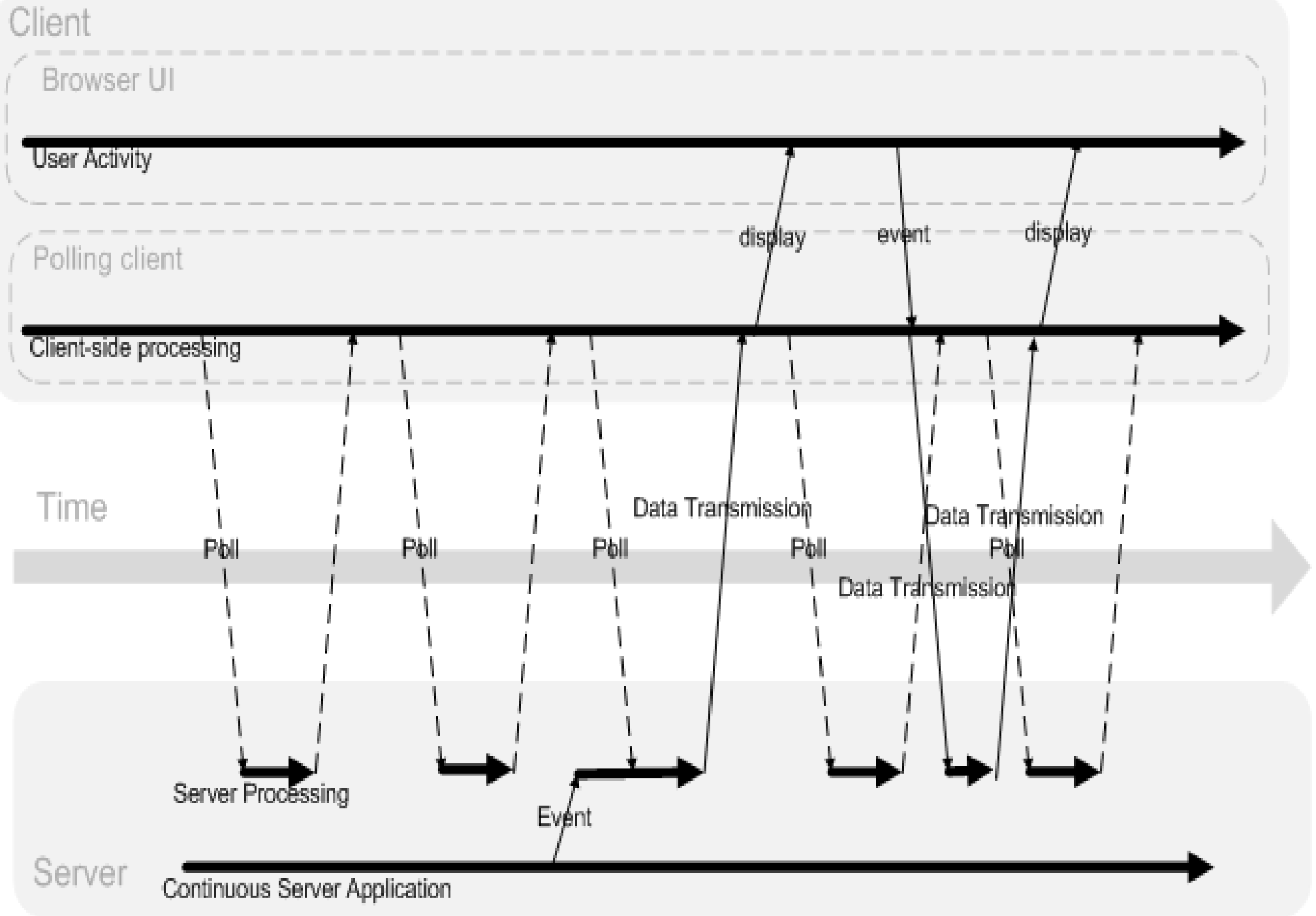
Reverse-Ajax techniques

1. Polling
2. Piggyback
3. Comet
4. WebSockets

1. Polling

I.e. Check for messages each 4 seconds

Polling Web Application Model



1. Polling

DEMO

2. Piggyback

Check for messages when an action is performed.

Piggyback Technique Web Application Model

Client

User Activity

User Activity

Time

Data Transmission

Data Transmission
With piggybacked event
information

Data Transmission

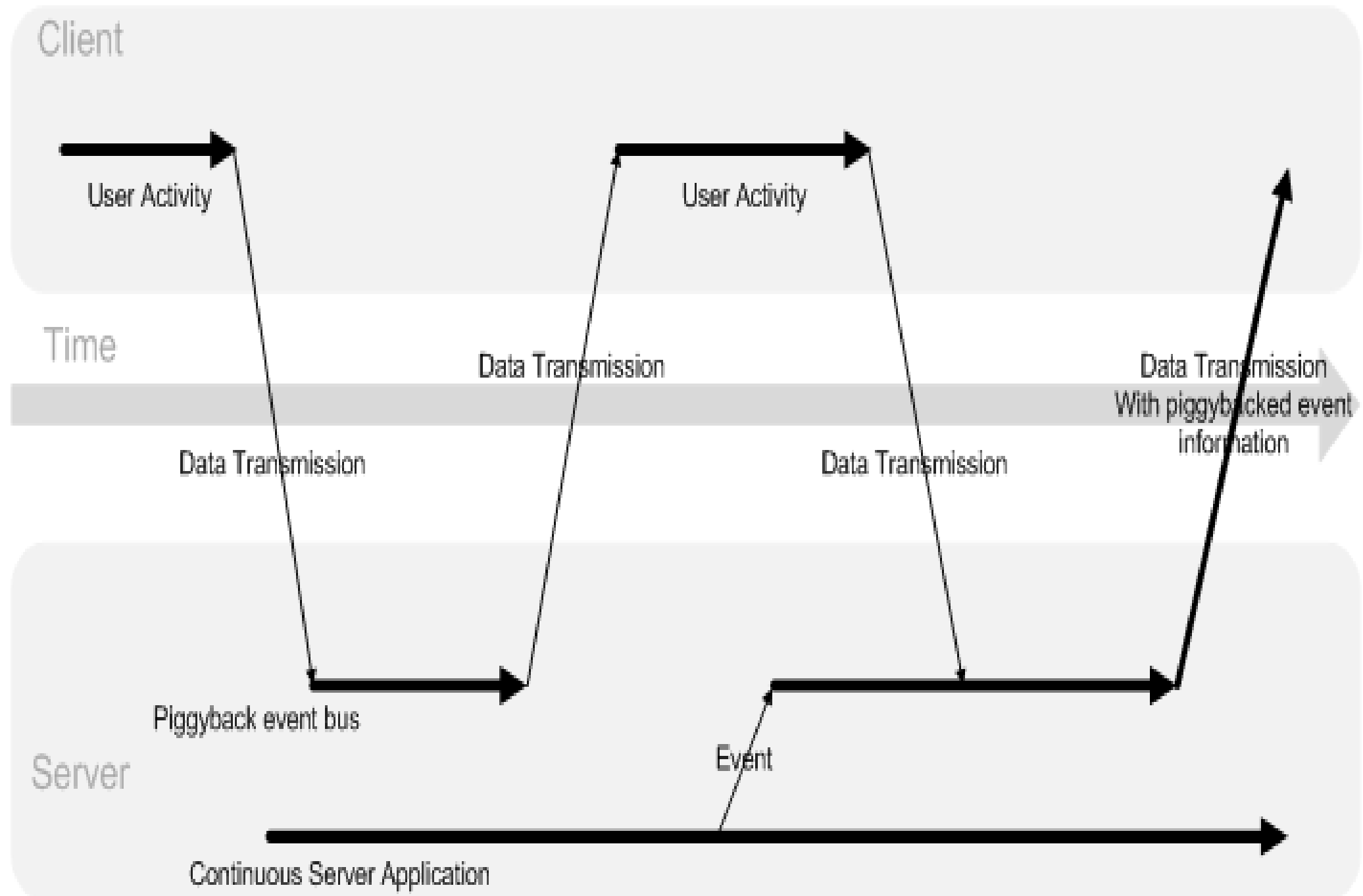
Data Transmission

Piggyback event bus

Event

Server

Continuous Server Application



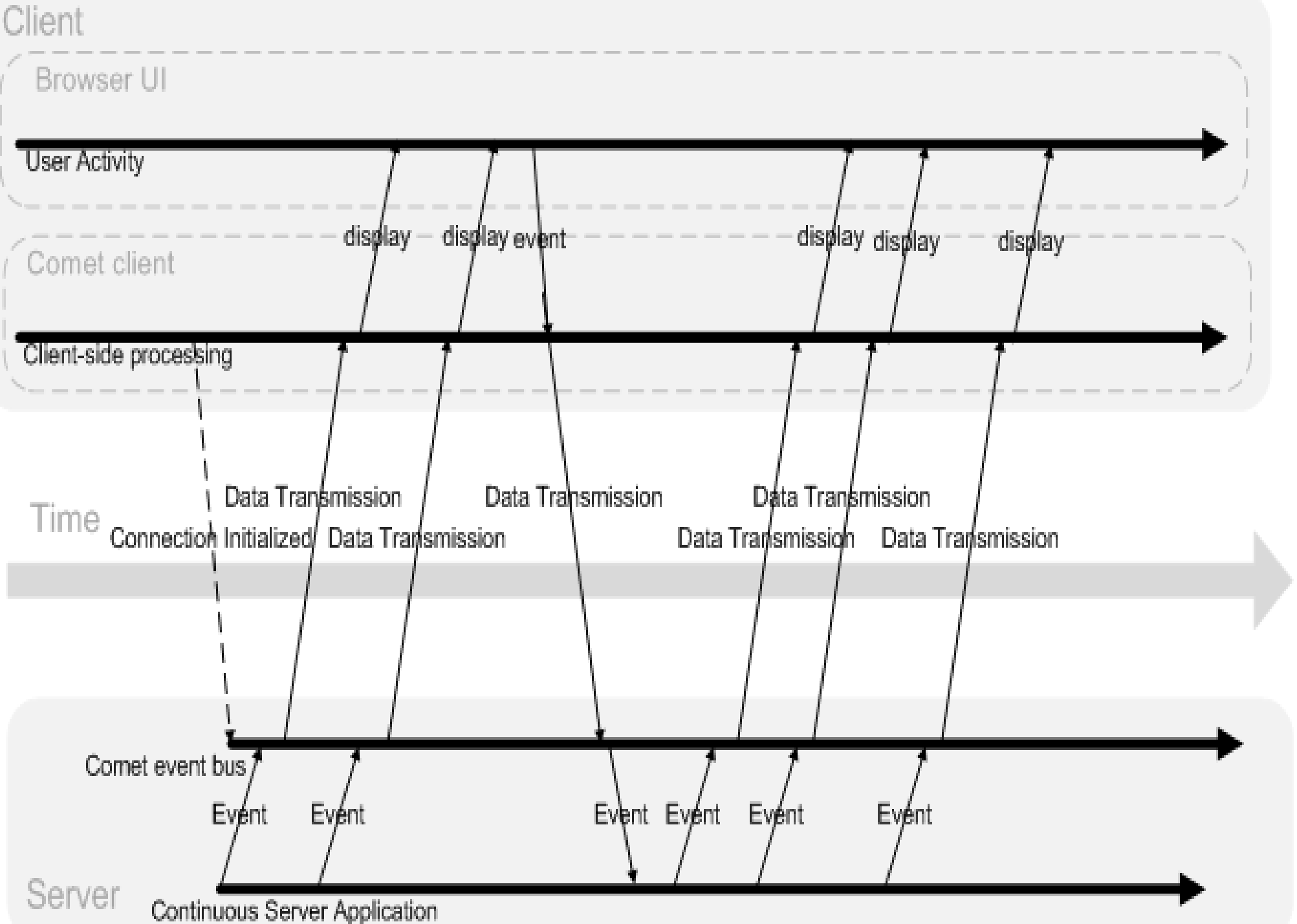
2. Piggyback

DEMO

3. Comet

A long-held HTTP request allows a web server to push data to a browser, without the browser explicitly requesting it.

Comet Web Application Model



3. Comet techniques

1. Long polling

- XMLHttpRequest
- Script tag

2. Stream based

- Forever Iframe
- XMLHttpRequest Multipart

3. Comet

DEMO

XMLHttpRequest Long Polling
(with Jetty Coninuations)

3. Comet

DEMO

XMLHttpRequest Multipart
(with Jetty Coninuations)

3. Comet

DEMO

XMLHttpRequest Multipart
(*with Servlet 3.0 API*)

4. WebSockets

WebSocket & FlashSockets

WebSocket is a technology providing for **bi-directional, full-duplex** communications channels. It is designed to be implemented in web browsers and web servers but it can be used by **any client or server application**.

Browser request to the server:

```
GET /demo HTTP/1.1
Upgrade: WebSocket
Connection: Upgrade
host: example.com
Origin: http://example.com
Sec-WebSocket-Key1: 4 @1 46546xW%01 1 5
Sec-WebSocket-Key2: 12998 5 Y3 1 .P00

^n:ds[4U
```

Server response:

```
HTTP/1.1 101 WebSocket Protocol Handshake
Upgrade: WebSocket
Connection: Upgrade
Sec-WebSocket-Origin: http://example.com
Sec-WebSocket-Location: ws://example.com/demo
Sec-WebSocket-Protocol: sample

8jKS'y:G*Co,Wxa-
```

4. WebSockets

DEMO

Reverse-Ajax for Java

- Cannot use standard Servlets
- Cannot use blocking I/O
- Cannot retain request thread

=> Needs NIO + Features

Reverse-Ajax for Java

You need 3 things:

1. A good server (NIO)
2. A good client library
3. A good backend library

Servers

- Jetty 8 (WebSocket, Comet)
- Grizzly (WebSocket, Comet)
- Tomcat 7 (Comet)

- All Servlet 3.0 based

Servers

- **For WebSocket:** only native, per container (i.e. *WebSocketServlet*)
- **For Comet:** Servlet 3.0 containers, Jetty Continuations
- Polling, Piggyback anywhere

Libraries

1. Socket.IO
2. Atmosphere
3. Cometd Bayeux
4. [...]

1. Socket.IO (transports)

- WebSocket
- Adobe Flash Socket
- Comet Long Polling
- Comet Multipart Streaming
- Comet Forever Iframe
- JSONP Polling

1. Socket.IO (client)

- Very good API
- Desktop & Mobile & Client-Server
- Fallback, reconnect, offline messages, event-driven, ...
- Event-Driven bridge (Ovea)

1. Socket.IO (client)

- Internet Explorer 5.5 - 8
- Safari 3 - 5
- Google Chrome 4 - 6
- Firefox 3-4
- Opera 10.61
- iPhone Safari
- iPad Safari
- Android WebKit
- WebOs WebKit

1. Socket.IO-Java

- Jetty Continuations (portable in any container)
- Native Jetty Websockets
- Servlet 3.0 support

1. Socket.IO

DEMO

Event-Driven Web

DEMO

Socket.IO + Ovea EventBus

2. Atmosphere (transports)

- WebSocket
- Comet (Polling & Streaming)

2. Atmosphere (client)

- Currently limited !
- JQuery integration
- BUT integration is possible
 - With Cometd
 - Socket.IO (to come ?)

2. Atmosphere (java)

- Nearly all containers
- Best native support
- Container detection
- WebSocket

2. Atmosphere

DEMO

3. Cometd (transports)

- WebSocket
- Comet Long Polling
- JSONP Polling
- The most reliable and performant

3. Cometd (client)

- Event-based
- JQuery / Dojo
- Desktop & Mobile & Client-Server, Any Browser
- Extensions
- Very good API

3. Cometd (java)

- Jetty Continuations (portable in any container)
- Native Jetty Websockets
- Servlet 3.0 support

3. Cometd

DEMO

Resources (info)

- Exploring Reverse AJAX
- Comet
- WebSocket
- Portable Jetty Continuations

Resources (projects)

- EventBus
- Socket.IO
- Socket.IO (Java)
- Atmosphere
- Cometd Bayeux

Reverse-Ajax

QUESTIONS ?

