

# Bidirectional HTTP

## Design Alternatives Overview



Linden Lab

**IETF 74**

**Mark Lentczner, March 2009**

**[zero@lindenlab.com](mailto:zero@lindenlab.com)**

# Four Approaches

BOSH

XEP-0124: Bidirectional-streams Over Synchronous HTTP, XMPP

<http://xmpp.org/extensions/xep-0124.html>

Bayeux

Bayeux Protocol, The Dojo Foundation

<http://svn.cometd.org/trunk/bayeux/bayeux.html>

WebSock

The Web Sockets API, W3C

<http://dev.w3.org/html5/websockets/>

<http://tools.ietf.org/html/draft-hixie-thewebsocketprotocol-03>

rHTTP

Reverse HTTP

<http://tools.ietf.org/html/draft-lentczner-rhttp-00>



# Four Motivations

## BOSH

Work around firewalls or environments that are restricted to HTTP

## Bayeux

Operate in an application environment (web page) where the only network functionality is XMLHttpRequest()

## WebSock

Create a bi-directional network facility for DOM environments

## rHTTP

Provide full HTTP request/response semantics in network environments where the responder can't accept connections



# Common Aim

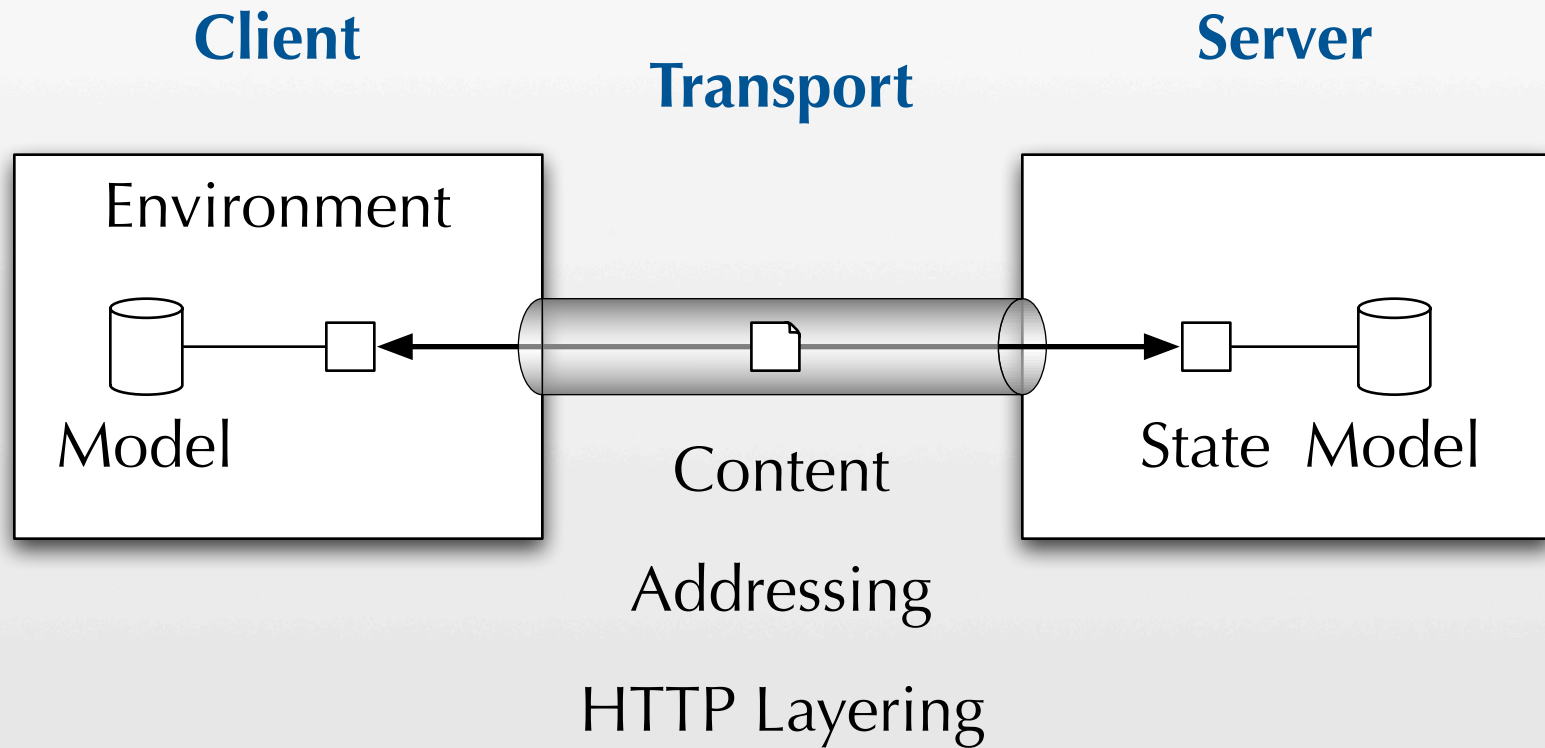
Support reversed flow over HTTP

-or-

Get data to the client at the server's whim!



# Structural Parts



# Client Environment

Where the client-side is running:

Application

BOSH, rHTTP

Web Page

Bayeux, WebSock



# Client Model

How the client views the communication:

Event-like

BOSH, Bayeux, WebSock

REST-like

rHTTP



# Content Model

The form of the content exchanged:

XML stanzas

BOSH

JSON objects

Bayeux

DOM strings

WebSocket

HTTP messages

rHTTP





# Addressing Model

How content is addressed:

Server sessions (streams)

BOSH

Pub/Sub channels

Bayeux

Stream endpoints

WebSock

URL named resources

rHTTP



# Content Transport

Data is moved through the system in:

Message Bodies

BOSH, Bayeux

Web Socket protocol

WebSock

HTTP

rHTTP



# Layering on HTTP

How the underlying HTTP connection is used:

Poll / Long Poll

BOSH, Bayeux

Upgrade

WebSock, rHTTP



# Server Side Model

How the protocol views the server side:

Event server

BOSH

Pub / Sub Queues

Bayeux

String datagram stream

WebSocket

REST client

rHTTP



# Server Side State

Server side state the protocol requires:

Session

BOSH

Subscription

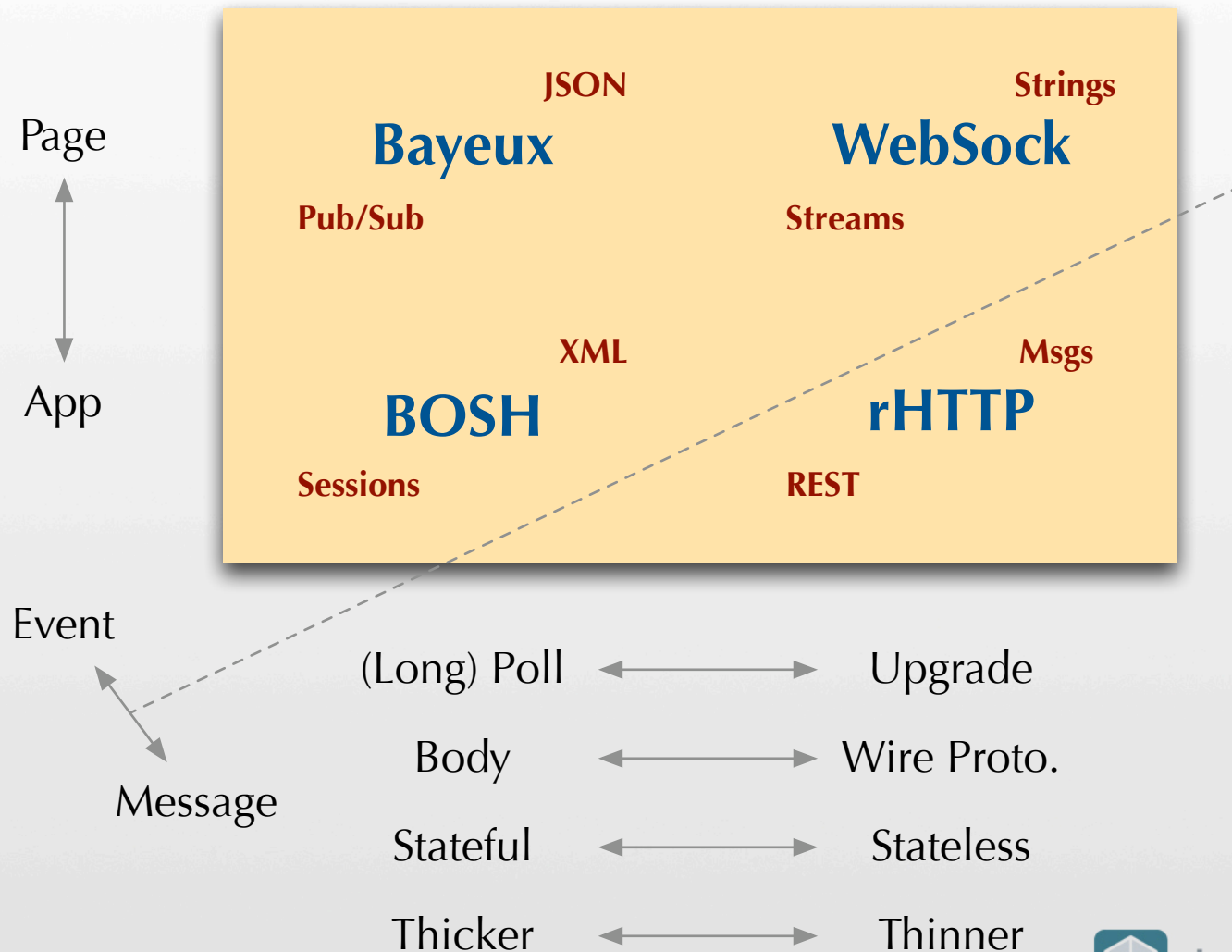
Bayeux

none

WebSock, rHTTP



# All Together



# Other Considerations

Polling & Idle Behavior

Interaction w/Proxies and Caches

Fallback Mechanisms



# GET /contributors HTTP/1.1

Lisa Dusseault

Mark Lentczner

Salvatore Loreto

Jack Moffitt

Peter Saint-Andre

Greg Wilkins

