HyBi Design Space
(draft-loreto-design-space-bidirectional-00)

HyBi BoF, IETF 76
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Motivation for this I-D

- Provide architectural context for:
  - Short-term solutions such as new HTTP headers for use with existing long-polling technologies (Comet, BOSH, etc.)
  - Long-term solutions such as WebSocket, BWTP, and Reverse HTTP

Major Considerations

- Discuss clients, servers, and a range of intermediaries
- Bidirectionality ("bidi") can change HTTP patterns:
  - Server can request resources of client
  - URIs on the client?
  - Message passing added to REST style

Clients 1: Browsers

- Standard HTTP (e.g., Comet, BOSH)
- Standard HTTP with extensions (e.g., to allow cross-domain functionality)
- Standard HTTP with plugin (of interest?)
- Invoke non-HTTP transport from within browser (e.g., WebSocket, BWTP)

Clients 2: Special-Purpose HTTP Clients

- Rich clients using standard HTTP (e.g., Second Life Viewer)
- Clients using a minimal subset of standard HTTP (e.g., XMPP clients with BOSH)
- Clients supporting HTTP with extensions, clients invoking non-HTTP transports (do we have examples of these?)

Servers 1: Standard HTTP

- Option 1: Bidi is part of the HTTP server's responsibilities
- Option 2: Bidi is handled by a server that is separate from the main HTTP server
- In both cases, events are transported over standard HTTP
- Examples: Comet, BOSH, Lightstreamer

Servers 2: Non-Standard

- In-Band: Bidi is part of HTTP server, but events are transported via an upgraded HTTP connection
- Out-of-Band: Bidi is part of separate server, and events are transported via a non-HTTP protocol
- Examples: WebSocket, BWTP

Intermediaries (1)

- Proxies
- Gateways
- Caching servers
- Load balancers
- Other?

Intermediaries (2)

- For standard HTTP transports that rely on legal HTTP (e.g., long polling), bidi is controlled using headers or cookies (some new headers might be helpful)
- For streaming HTTP transports, bidi depends on packet-by-packet transmission, so caching and buffering by intermediaries can disrupt communication

Intermediaries (3)

- Some existing non-HTTP transports might tunnel their protocol over the HTTP CONNECT mechanism (is this abusive?)
- For yet-to-be-defined transports that invoke non-HTTP methods, upgraded intermediaries of the future might provide special support for relaying