

Performance Evaluation of WebSocket Protocol for Implementation of Full-Duplex Web Streams

Oleg Bilovus

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1st Scalability Research Forum

Outline

WebSocket

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Background

HTTP polling

HTTP long polling

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WebSocket protocol

Definition

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- ▶ *Historically*, creating web applications that need bidirectional communication between a client and a server has required an abuse of HTTP to poll the server for updates while sending upstream notifications as distinct HTTP calls.

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HTTP polling

Check whether the server is changed in a while, thereby performing incremental updates.

Background

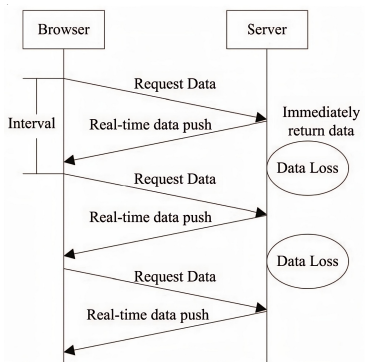
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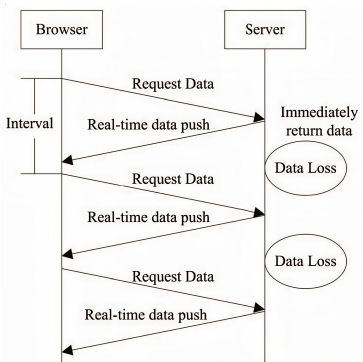
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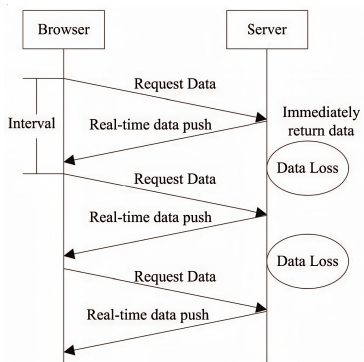
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► How often to query?



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Check whether the server is changed in a while, thereby performing incremental updates.



- ▶ How often to query?
- ▶ Continuously short interval requests will be washed away the server.

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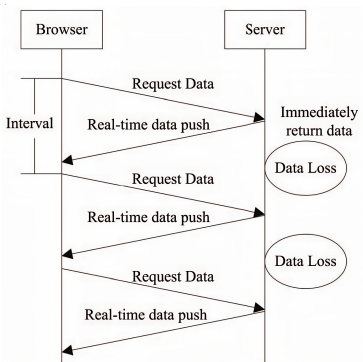
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- ▶ How often to query?
- ▶ Continuously **short interval** requests will be **washed away** the server.
- ▶ **Long interval** will require more time to reach the client, **no real-time** data.

HTTP long polling

Background

HTTP polling

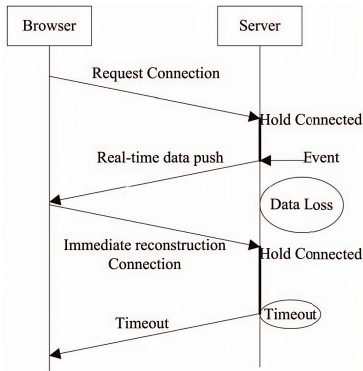
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Definition

When a client sends a data request, the server will block the request until there is data transfer or timeout before returning.



HTTP long polling

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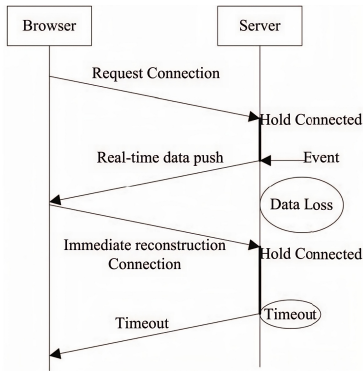
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When a client sends a data request, the server will block the request until there is data transfer or timeout before returning.



► Solve the short polling frequency to access the server.

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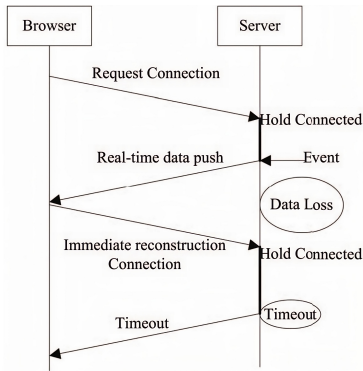
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When a client sends a data request, the server will block the request until there is data transfer or timeout before returning.



- Solve the short polling frequency to access the server.
- No bidirectional communication, server push data.

Streaming

Iframe embed a hidden frame in an HTML page, then set it as a long connection request, thus the server can send data to the clients constantly.

Background

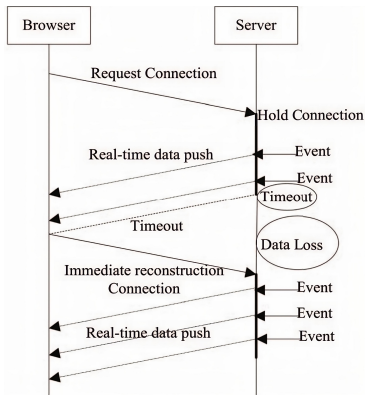
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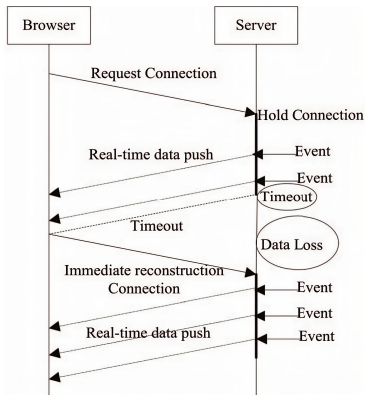
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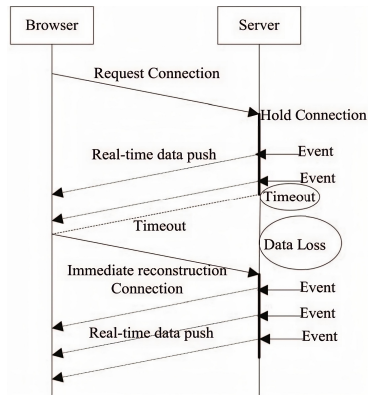
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- It can send multiple events from a single request.



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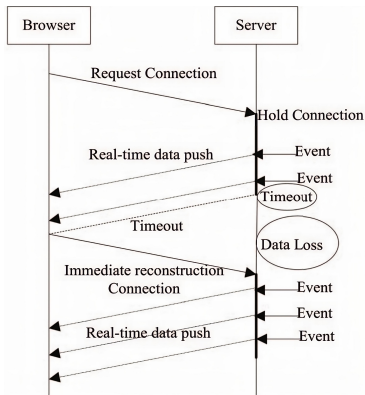
Iframe embed a hidden frame in an HTML page, then set it as a long connection request, thus the server can send data to the clients constantly.



- ▶ It can send **multiple events** from a **single request**.
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- ▶ It can send **multiple events** from a **single request**.
- ▶ But, it increases the **burden on the server**, causing the server **performance degradation**, or even collapse.
- ▶ **No bidirectional communication.**

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RFC 6455

Keywords

- ▶ The WebSocket Protocol enables two-way communication between a client running untrusted code in a controlled environment to a remote host that has opted-in to communications from that code.

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