HeaderDiff

draft-ruellan-headerdiff-00

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Overview

- Compact encoding of HTTP headers
  - Take advantage of similarities between header sets

- Encoder driven
  - Simple and “generic” decoder
  - Encoder can be simple or very complex
    - Adaptable to different scenario
    - Adaptable to HTTP usage evolution
Index Tables

• Name Table
  • Index of all the header names
  • Pre-populated with common entries

• Header Table
  • Index of (name, value) pairs
  • Three choices for a new pair
    • Not added to the table
    • Added to the table
    • Replace an existing pair
Table Management

- Table management decided by encoder
  - Simpler decoder
  - Support any table management algorithm

Decide value indexation:
- Not indexed
- Added
- Replace old value
Header Representation

- **Index**
  - Reference to a (name, value) pair

- **Literal**
  - Existing or new name
  - New value

- **Delta**
  - Reference to a (name, value) (same name)
  - Value has a shared prefix + new suffix
Deflate

- Post-processing of encoded headers
  - More compact and faster than SPDY/3

- Optional Step
  - Too costly in some setups
  - Can be source of security risks
    - Subject to CRIME attacks
First Results

Codec size relative to HTTP size

<table>
<thead>
<tr>
<th></th>
<th>Request</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPDY/3</td>
<td>9.77 %</td>
<td>14.68 %</td>
</tr>
<tr>
<td>HeaderDiff (32K buffer)</td>
<td>15.5 %</td>
<td>15.24 %</td>
</tr>
<tr>
<td>HeaderDiff (4K buffer)</td>
<td>21.06 %</td>
<td>25.84 %</td>
</tr>
<tr>
<td>HeaderDiff + Deflate</td>
<td>6.27 %</td>
<td>10.06 %</td>
</tr>
</tbody>
</table>
Summary

• Compact HTTP Header representation
  • Controller by Encoder
    • Very adaptable
    • Simple Decoder

• Good compaction results
  • Can adapt to small buffer

• Combine well with Deflate
  • Optional step
Questions?

Spec: draft-ruellan-headerdiff-00
Code: https://github.com/http2/compression-test