

HeaderDiff

Hervé Ruellan - Canon CRF

Overview

- Compact encoding of HTTP headers
 - Take advantage of similarities between header sets
- Encoder driven
 - Simple, “generic” and “dumb” decoder
 - Encoder can be simple or very complex
 - Adaptable to different scenario
 - Adaptable to HTTP usage evolution

Principle

- Header Table: list of (name, value) pairs
 - Most headers represented as index
 - Customizable maximum size
 - Works well with small size
- Encoder decides insertions and deletions
 - Transmitted on the wire
 - Simpler for the decoder

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

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 common prefix + new suffix

Low-Level Encoding

- Design
 - Byte-aligned streams
 - Frequent headers encoded on 1 byte
- Implementation
 - Representation choice: 2-3 bits
 - Indexing mode (add or replace): 1 bit
 - Data: remaining bits + 0 or more bytes

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

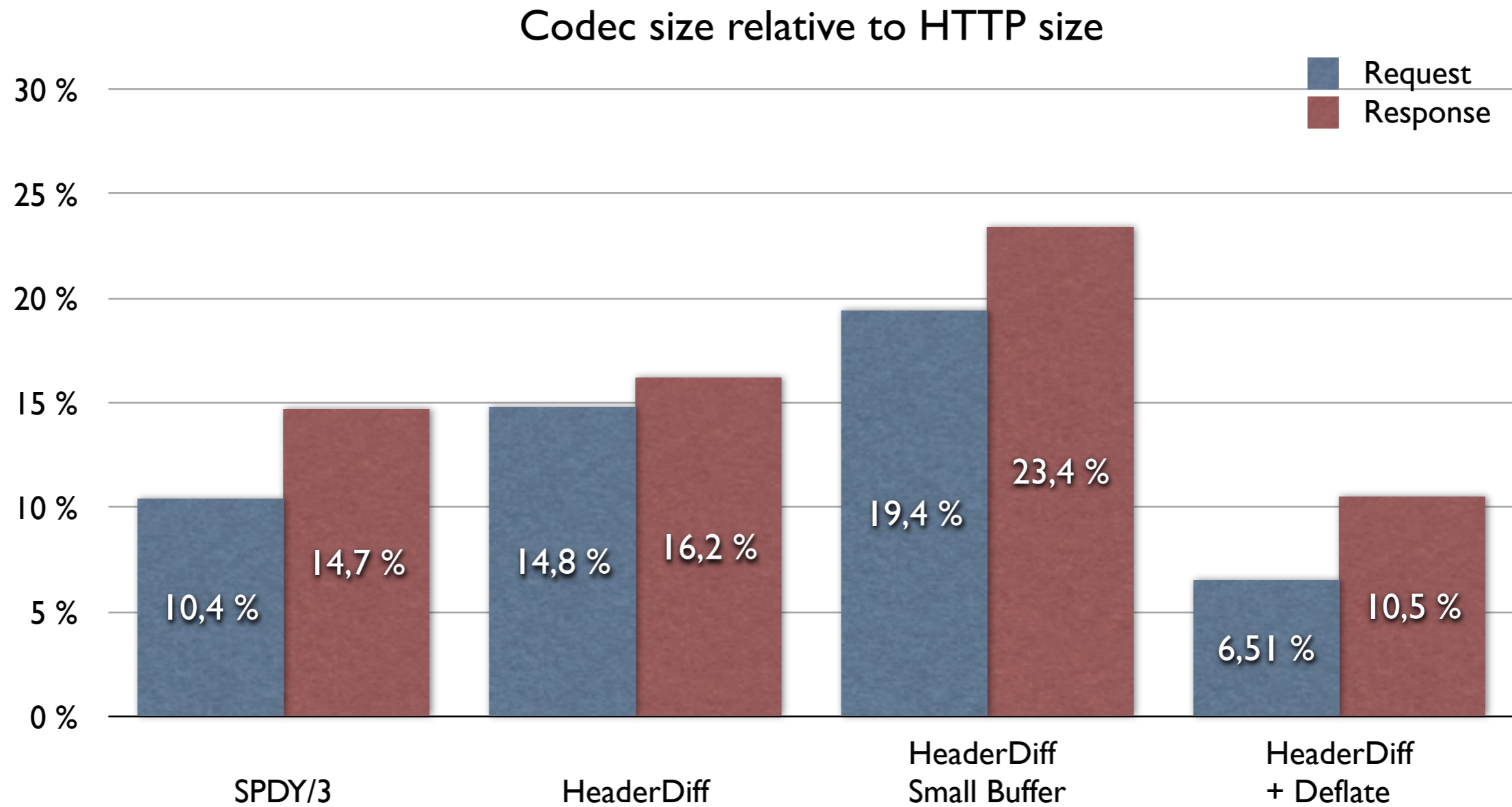
Making Deflate Secure

- Disable Deflate for sensitive interactions
 - Secure connections (i.e. https) in open environments (i.e. browser)
- Use a partial Deflate
 - Sensitive headers are not compressed
- Remove sensitive information from headers
 - New authentication mechanism

Open Questions

- Typed Codecs
 - Dates, integers...
- Parameter Negotiation
 - Maximum Header Table size
 - Deflate usage

Preliminary Results



Summary

- Compact HTTP Header representation
 - Simple and “dumb” Decoder
 - Controller by Encoder
- Good compaction results
 - Can adapt to small buffer
- Combine well with Deflate
 - Optional step

Questions?