

Context-Aware Encoding & Delivery in the Web

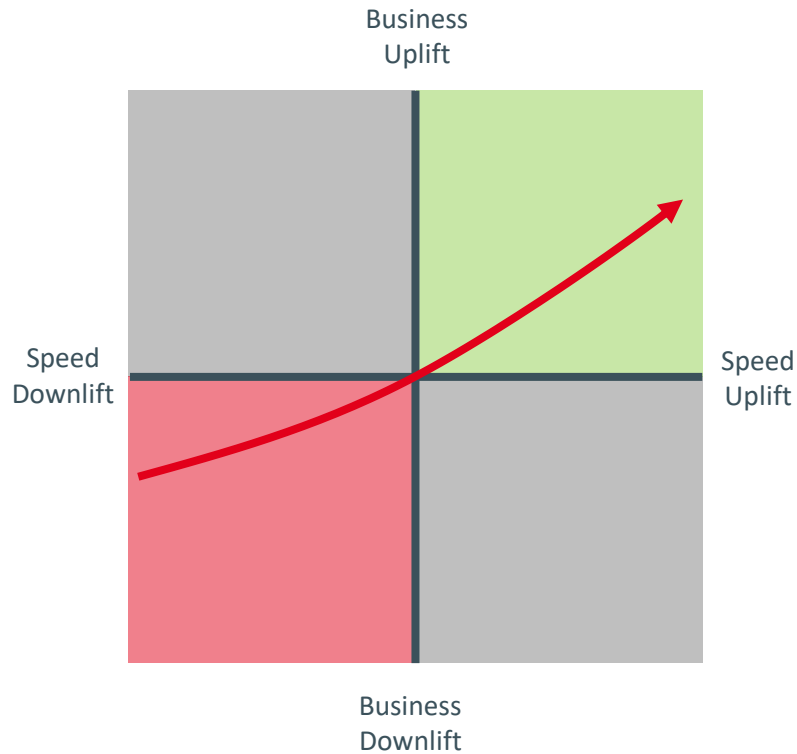
ICWE 2020

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Business Impact of Page Speed



Google

500ms slower loads
decreased traffic by 20%

Walmart 

100ms faster website
increases revenue by 1%

amazon

100ms slower website
lowers conversion rate by 1%

 **zalando**

100ms faster website
increase revenue per
session by 0.7%

OTTO

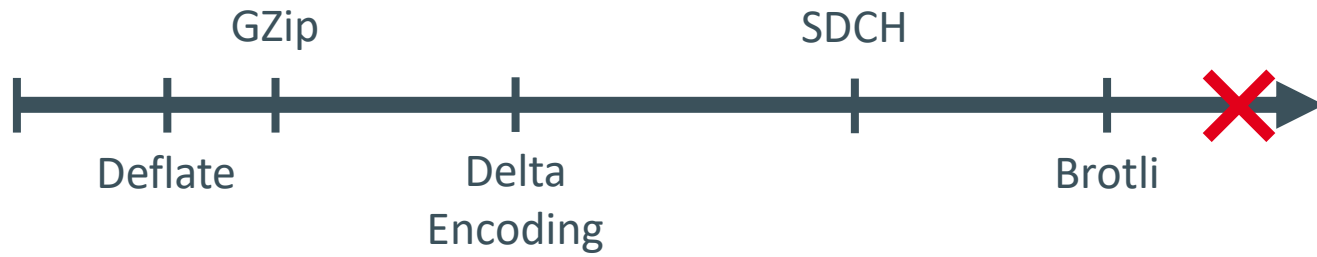
42% decrease in time to
FCP raises session length
by 25%

Pinterest

40% load acceleration
increases SEO traffic by
15%




So Far On Compression...



GZIP/Deflate – The De Facto Standard in the Web

This example text is used to show how LZ77 finds repeating elements in the [70;14]



Encoding	Size
None	200 kB
Gzip	~36 kB

~81.9% saved data



Delta Encoding – Updating Stale Content

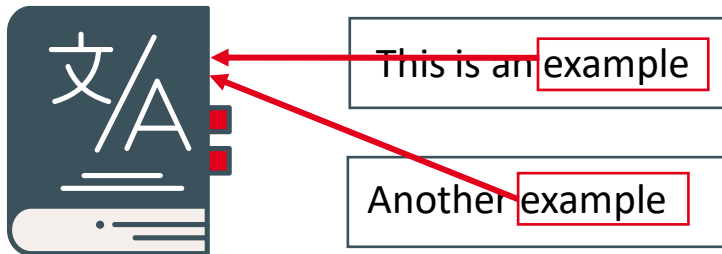
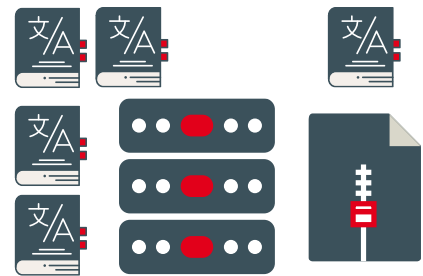


Encoding	Size
None	200 kB
Gzip	~36 kB
Delta Encoding	~34 kB

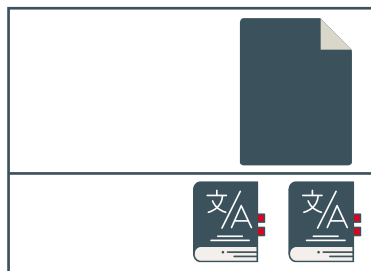
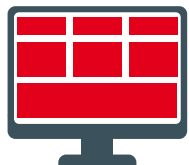
83% saved data



SDCH – Reusing Dictionaries



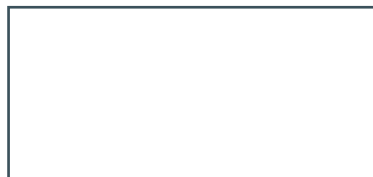
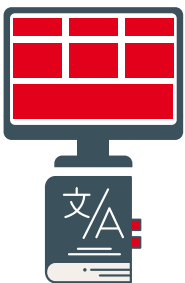
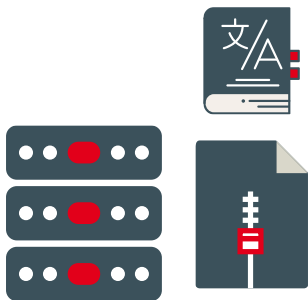
Encoding	Size
None	200 kB
Gzip	~36 kB
Delta Encoding	~34 kB
SDCH	~7 kB



Up to 81% better results
(compared to gzip)



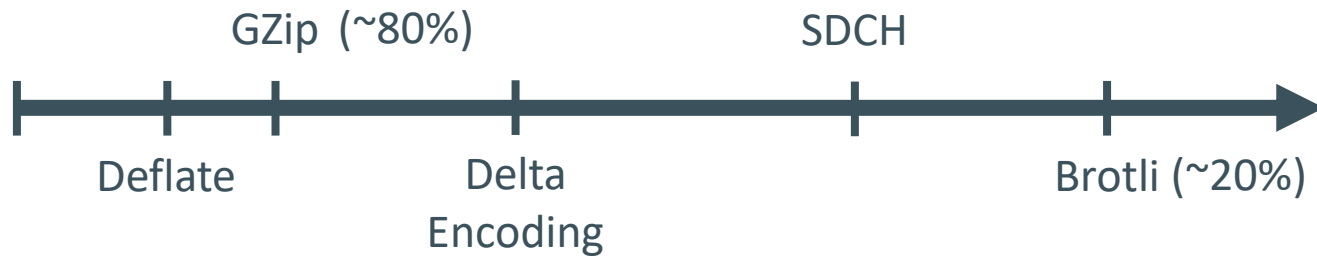
Brotli – SDCH for Everyone



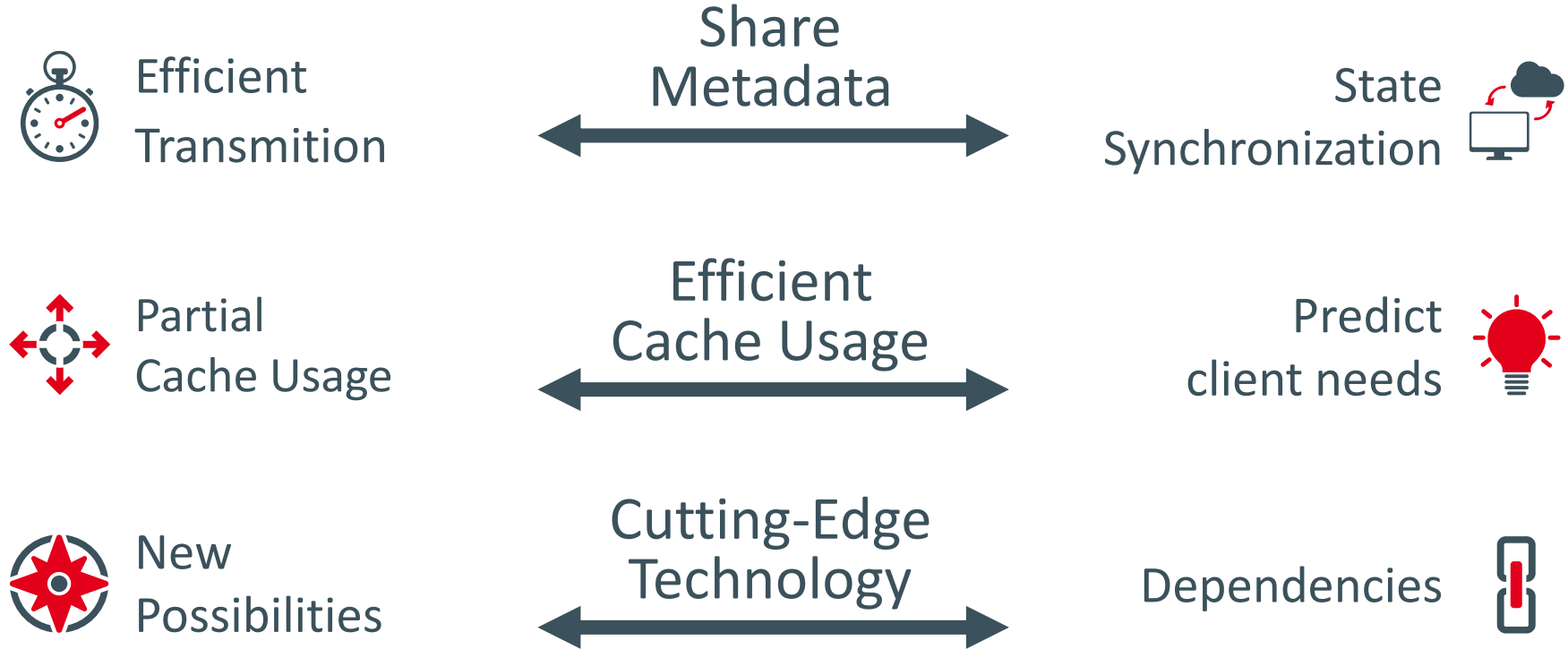
Encoding	Size
None	200 kB
Gzip	~36 kB
Delta Encoding	~34 kB
SDCH	~7 kB
Brotli	~29 kB

~85.6% saved data

So Far On Compression... Theory vs. Reality

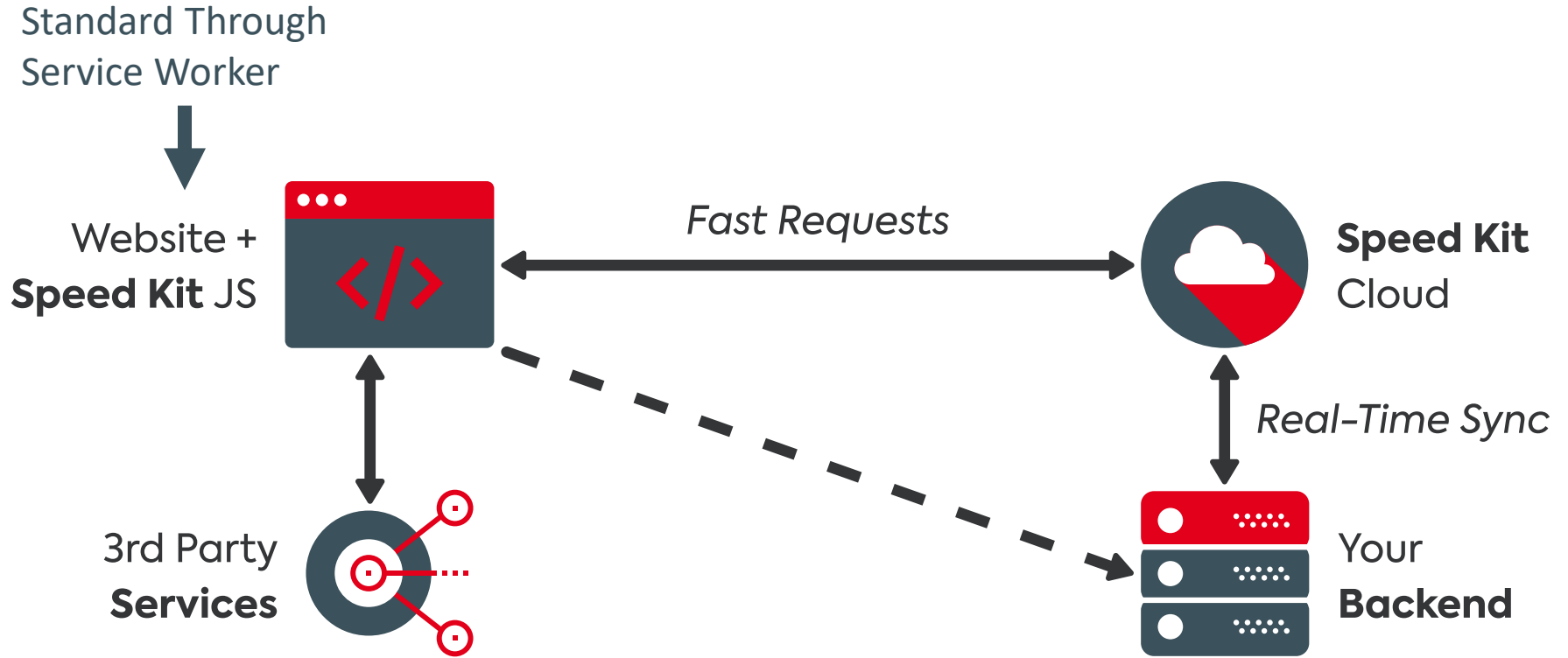


What Went Wrong?



Dependencies on non-standardized features

Speed Kit – Enabling End-To-End Optimizations





Gold Standard

Understand potential gains of different encodings

1

Evaluate Delta Encoding



Cross-Entity Scope

Find closed delta to an arbitrary related file

3

The First Implementation



End-to-End Approach

Control over the whole architecture from client to server

2

Implement Prototype on Top of Speed Kit



Context-Aware Optimizations

Autonomously choose protocol to a given runtime context

4

Start with Brotli and Cross-Entity Encoding

Thanks!



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