Benchmarks for Protocol Buffers and JSON

while using Swift 3 for both client and server

Twitter:
@DorinDanciu

WHEN I WAS YOUR AGE

XML WAS THE JSON

memegenerator.net

History Lesson

XML	JSON	Protocol Buffers
1996	2001	2008 (Public)
21 years ago	17 years ago	9 years ago

Protocol Buffers

```proto
syntax = "proto3";


message Beer {
    double alcohol = 1;
    string name = 2;
    string brewedBy = 3;
    string style = 4;
    string availability = 5;
    string serving = 6;
    string details = 7;
}

message BeerList {
    repeated Beer beers = 1;
}
```
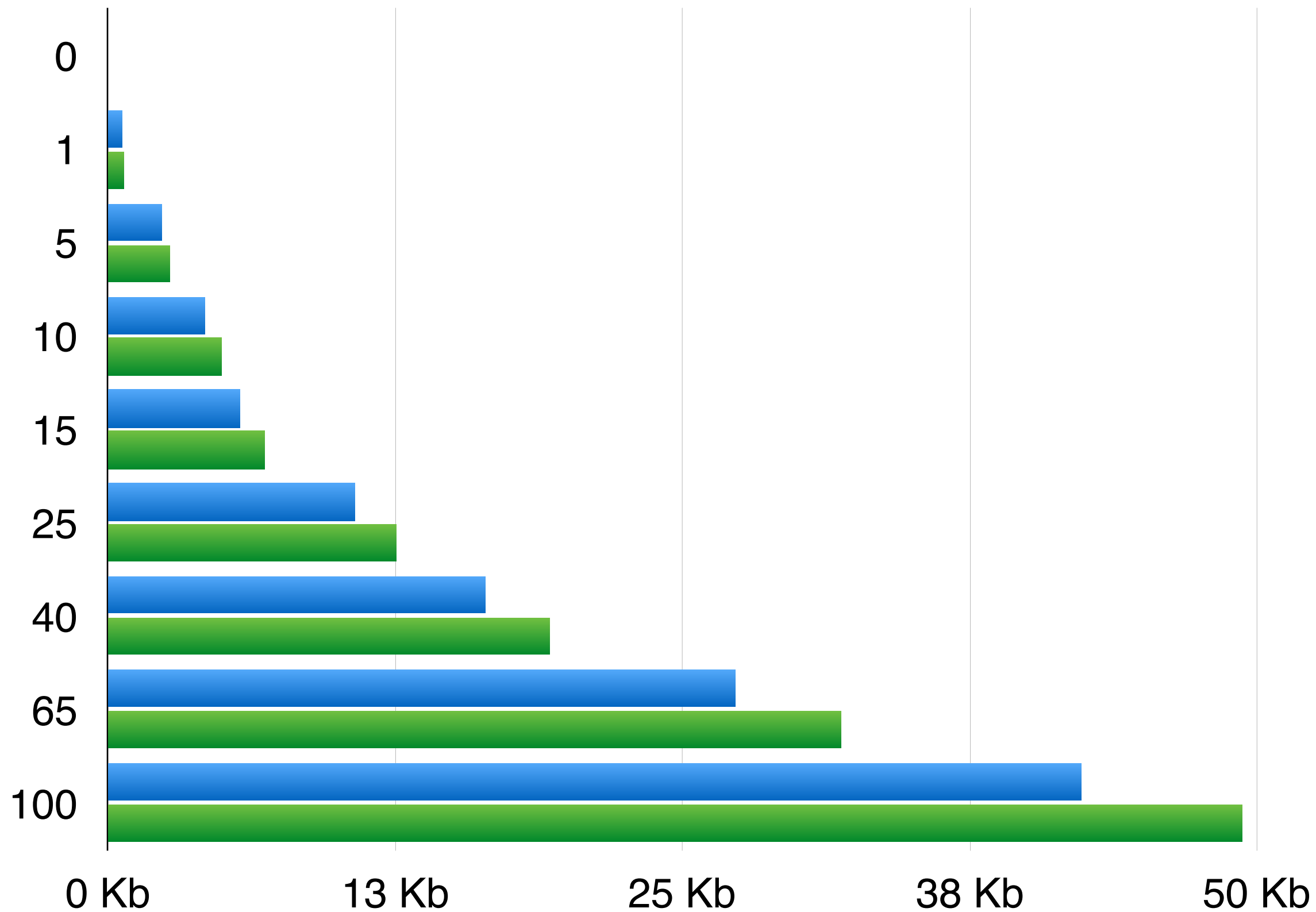
- model

- tags

- protoc

My Test Bench Setup

- Mac Mini (Mid 2011)

  - 2.5 GHz Intel Core i5

  - 8 GB 1333 MHz DDR3

  - 250 GB Samsung SSD

  - OS X El Capitan 10.11.6

  - Xcode 8.2.1

  - Vapor 1.4

Size comparison

Records number	Proto (Size bytes)	JSON (Size bytes)	JSON's footprint is x % larger
0	0	2	0,00
1	634	715	12,78%
5	2347	2709	15,42%
10	4230	4939	16,76%
15	5771	6831	18,37%
25	10778	12543	16,38%
40	16406	19221	17,16%
65	27314	31882	16,72%
100	42330	49349	16,58%

Fetch on local wifi network

Records number	Proto (Load time in seconds)	JSON (Load time in seconds)	Decrease while using Proto
0	0,029	0,039	-25,64%
1	0,031	0,058	-46,55%
5	0,068	0,137	-50,36%
10	0,049	0,146	-66,44%
15	0,053	0,227	-76,65%
25	0,118	0,365	-67,67%
40	0,1	0,5	-80,00%
65	0,217	0,859	-74,74%
100	0,313	0,969	-67,70%

Fetch on local wifi network - 3G simulation

Records number	Proto (Load time in seconds)	JSON (Load time in seconds)	Decrease / Increase while using Proto
0	0,535	0,607	-11,86%
1	0,488	0,531	-8,10%
5	0,654	0,580	12,76%
10	0,720	0,628	14,65%
15	0,632	0,722	-12,47%
25	0,613	1,089	-43,71%
40	0,866	0,947	-8,55%
65	0,678	0,840	-19,29%
100	0,802	0,866	-7,39%

Serialize model on Server

Records number	Proto	JSON	Decrease while using Proto
0	0,000	0,000	0,00%
1	0,000	0,001	-100,00%
5	0,001	0,004	-75,00%
10	0,001	0,007	-85,71%
15	0,002	0,010	-80,00%
25	0,004	0,020	-80,00%
40	0,005	0,030	-83,33%
65	0,008	0,050	-84,00%
100	0,012	0,076	-84,21%

Deserialize model on client

Records number	Proto	JSON	Decrease while using Proto
0	0,000	0,001	0,00%
1	0,003	0,008	-62,50%
5	0,009	0,029	-68,97%
10	0,017	0,054	-68,52%
15	0,021	0,070	-70,00%
25	0,037	0,127	-70,87%
40	0,055	0,197	-72,08%
65	0,093	0,327	-71,56%
100	0,131	0,492	-73,37%
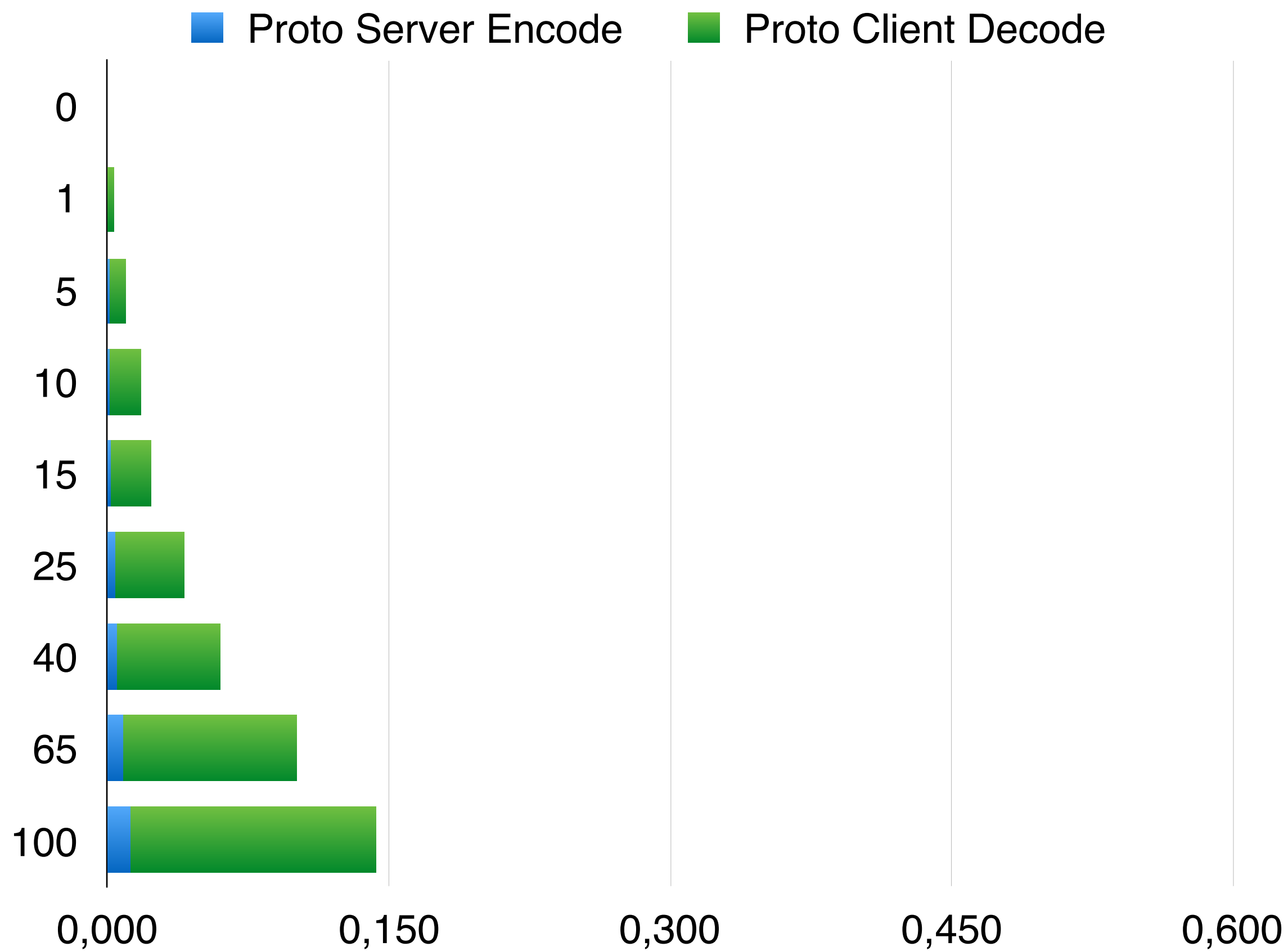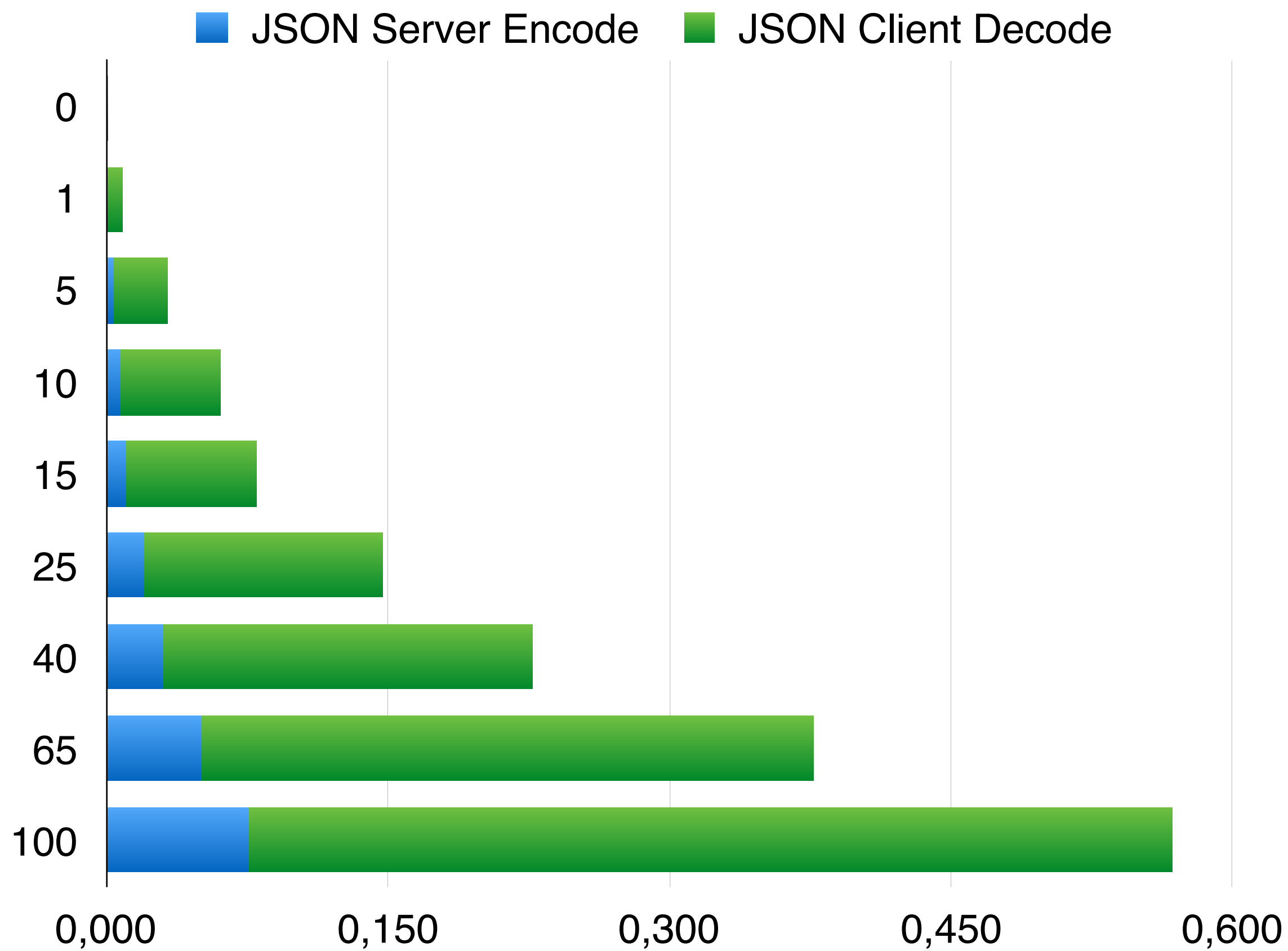
Serialize on Server and Deserialize on Client

Records number	Total Times Proto	Total times JSON	Decrease while using Proto
0	0,000	0,001	0,00%
1	0,003	0,009	-66,67%
5	0,01	0,033	-69,70%
10	0,018	0,061	-70,49%
15	0,023	0,080	-71,25%
25	0,041	0,147	-72,11%
40	0,06	0,227	-73,57%
65	0,101	0,377	-73,21%
100	0,143	0,568	-74,82%

⁉️👏🏻