

Commparation of Kafka and ZeroMQ

September 30, 2024

While gathering this data and conducting experiments, I am using a 13.3-inch MacBook Pro with an Apple M2 chip.

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- **İşlemci:** Apple M2 çipi
- **Bellek:** 24 GB RAM
- **Depolama:** 1 TB SSD
- **Grafik Kartı:** Apple M2'nin entegre GPU'su

Single Producer Single Consumer

Table 1: ZeroMQ and Kafka Sending Times

Message Size (MB)	ZeroMQ Sending Time (seconds)	Kafka Sending Time (seconds)
1	0.000073	0.0020
2	0.000422	0.0037
4	0.000560	0.0075
8	0.000460	0.0142
16	0.001493	0.0272
32	0.004511	0.0530
64	0.008909	0.1018
128	0.021017	0.2110
256	0.046990	–
512	0.094557	–
1024	0.212708	–
2048	0.396469	–

Table 2: ZeroMQ and Kafka Receive Times

Message Size (MB)	ZeroMQ Receive Time (seconds)	Kafka Receive Time (seconds)
1	0.000543	0.0001
2	0.001730	0.0002
4	0.002320	0.0004
8	0.003271	0.0007
16	0.007853	0.0012
32	0.017101	0.0027
64	0.032268	0.0047
128	0.078984	—
256	0.158952	—
512	0.304910	—
1024	0.989352	—
2048	1.216786	—

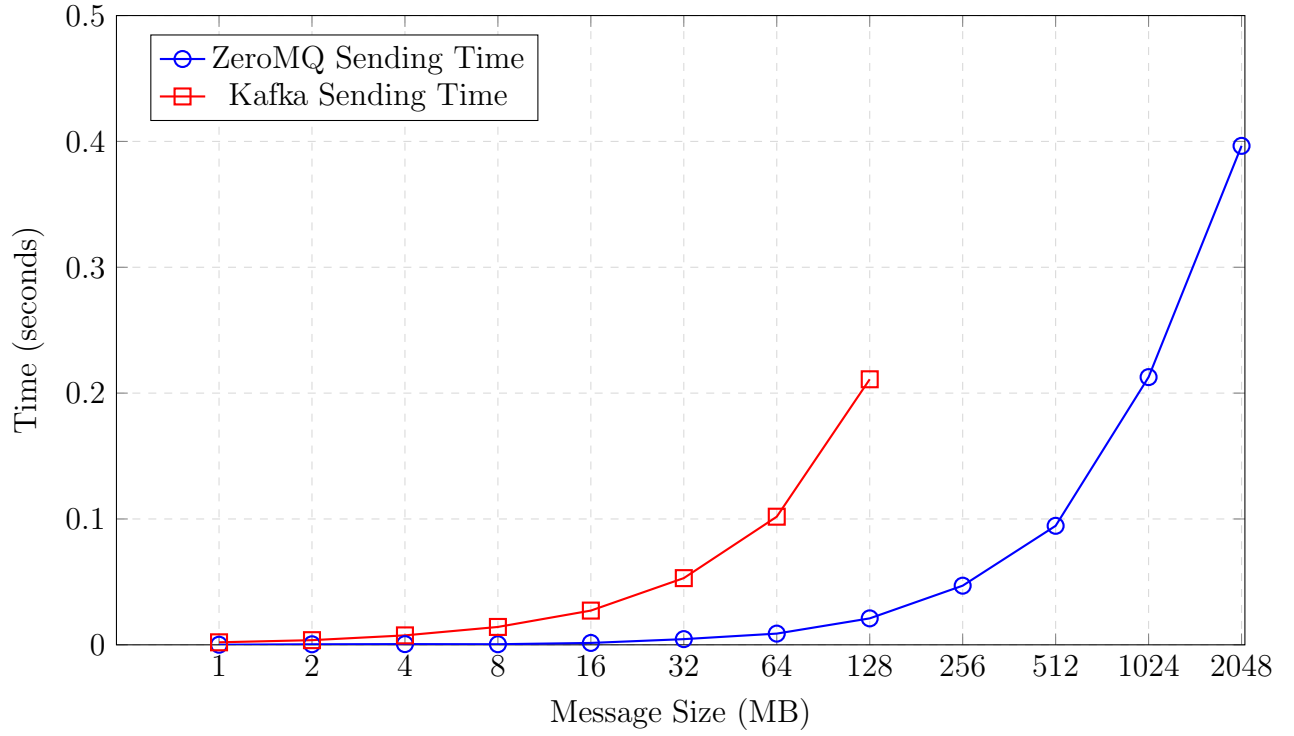


Figure 1: Message Size vs Time for Sending

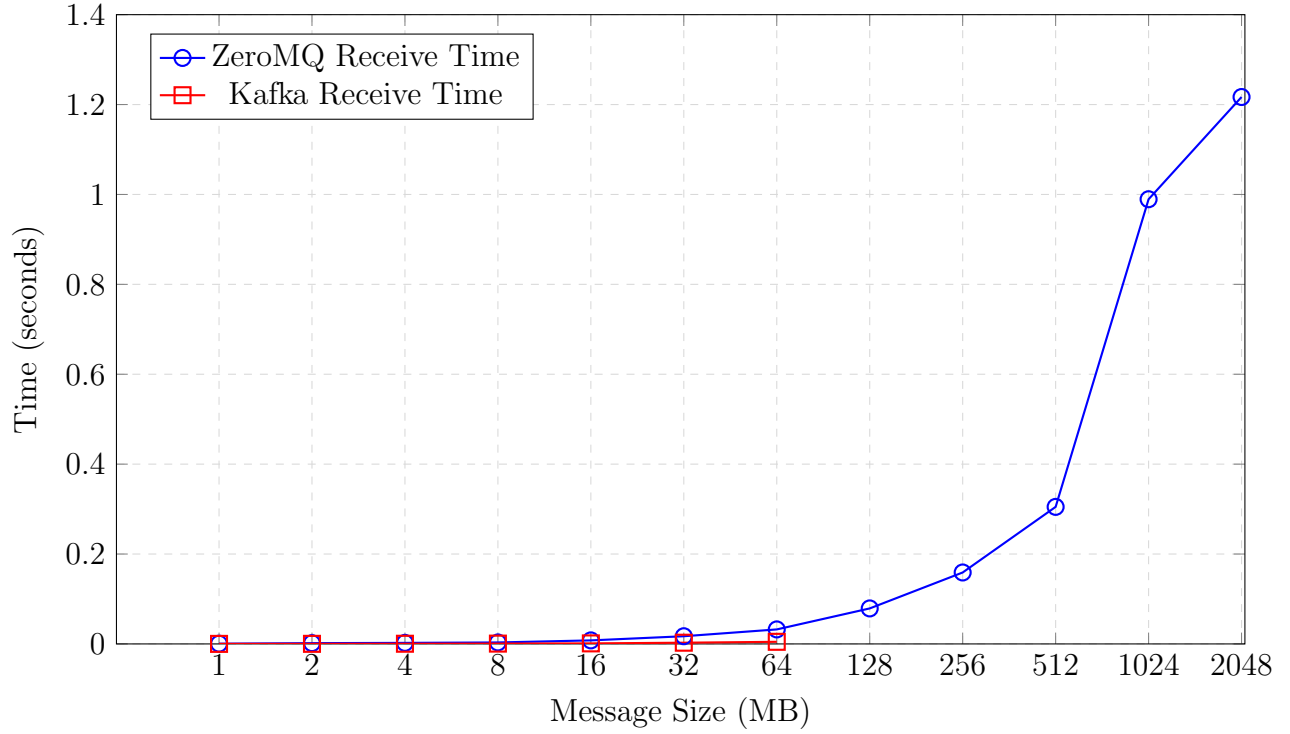


Figure 2: Message Size vs Time for Receiving

Single Producer Multiple Consumer

Message Size (MB)	ZeroMQ Receive Time1 (seconds)	Kafka Receive Time1 (ms)
1	1.005368	0.0001
2	1.004067	0.0003
4	1.004235	0.0004
8	0.995442	0.0009
16	0.985381	0.0016
32	0.995953	0.0035
64	0.994809	0.0069
128	0.973699	-
256	0.950010	-
512	0.897066	-
1024	0.848178	-
2048	1.270312	-

Table 3: Comparison of ZeroMQ Receive Time and Kafka Receive Time1 Time

Message Size (MB)	ZeroMQ Receive Time2 (seconds)	Kafka Receive Time2(ms)
1 MB	1.006101	0.0001
2 MB	1.006090	0.0003
4 MB	1.009415	0.0004
8 MB	1.006794	0.0003
16 MB	1.004705	0.0016
32 MB	1.022613	0.0030
64 MB	1.019397	0.0066
128 MB	1.045973	-
256 MB	1.026559	-
512 MB	1.032544	-
1024 MB	1.407824	-
2048 MB	1.112928	-

Table 4: Comparison of ZeroMQ Receive Time and Kafka Receive Time1 Time

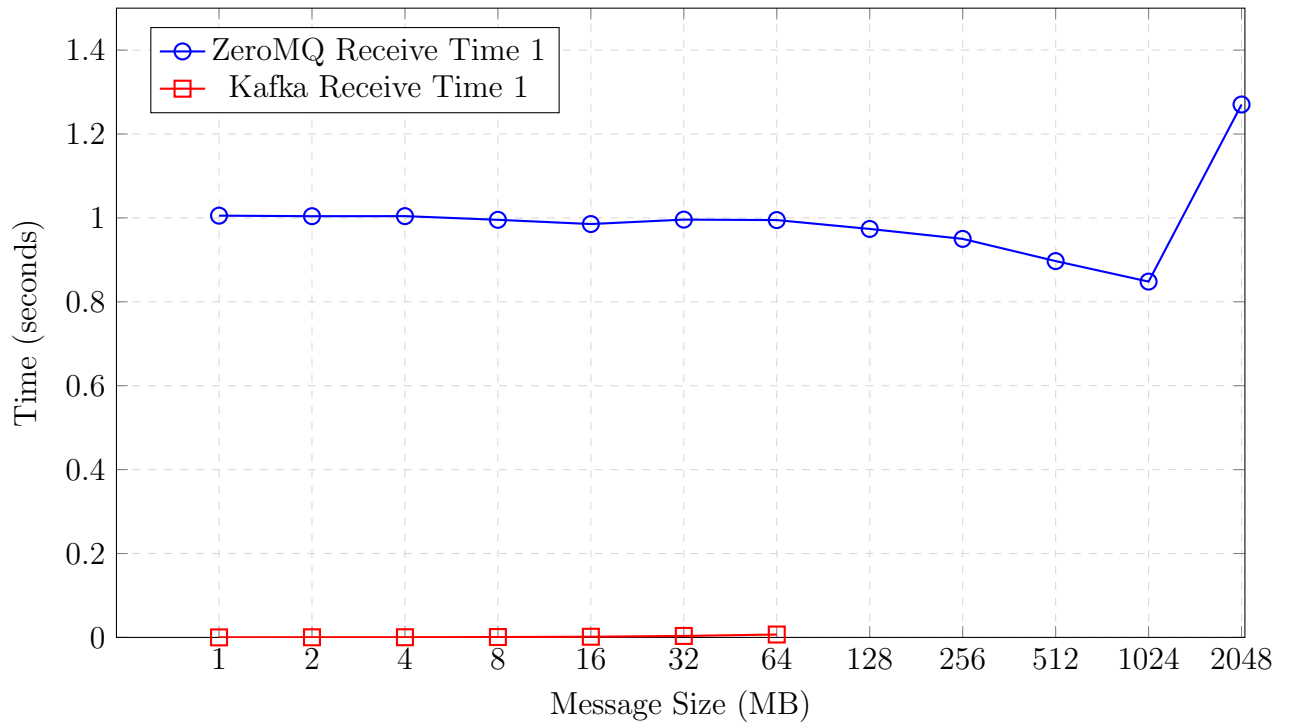


Figure 3: Message Size vs Time for Receiving 1

Multiple Producer Multiple Consumer

Table 5: Comparison of ZeroMQ and Kafka Message Delivery Times

Message Size (MB)	ZeroMQ Sending Time1 (seconds)	Kafka Sending Time1 (seconds)	ZeroMQ Sending Time2 (seconds)	Kafka Sending Time2(seconds)
1	0.000094	0.0020	0.000078	0.0020
2	0.000423	0.0038	0.000306	0.0035
4	0.000628	0.0065	0.000556	0.0071
8	0.001495	0.0141	0.000927	0.0131
16	0.002240	0.0275	0.002129	0.0247
32	0.005310	0.0494	0.004208	0.0529
64	0.010499	0.1018	0.012074	0.1109
128	0.059005	0.2159	0.038298	0.2326

Table 6: Comparison of ZeroMQ and Kafka Message Receive Times

Message Size (MB)	ZeroMQ Receive Time1 (seconds)	Kafka Receive Time1 (seconds)	ZeroMQ Receive Time2 (seconds)	Kafka Receive Time2 (seconds)
1	0.000618	0.0001	0.000914	0.0001
2	0.001411	0.0002	0.002154	0.0002
4	0.002858	0.0004	0.004003	0.0004
8	0.005567	0.0003	0.006367	0.0003
16	0.011214	0.0016	0.015109	0.0016
32	0.024491	0.0031	0.030561	0.0032
64	0.047140	0.0063	0.056744	0.0063
128	0.122018	0.0180	0.137208	0.0178

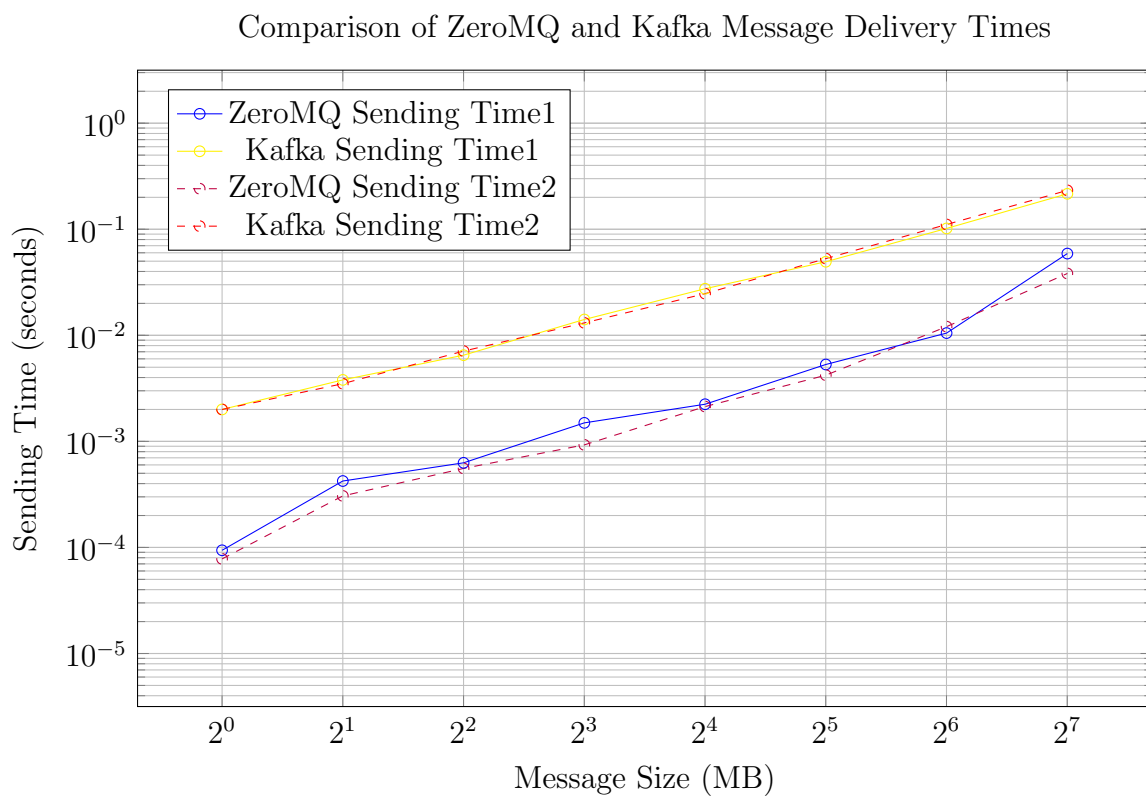


Figure 4: Comparison of ZeroMQ and Kafka Message Delivery Times

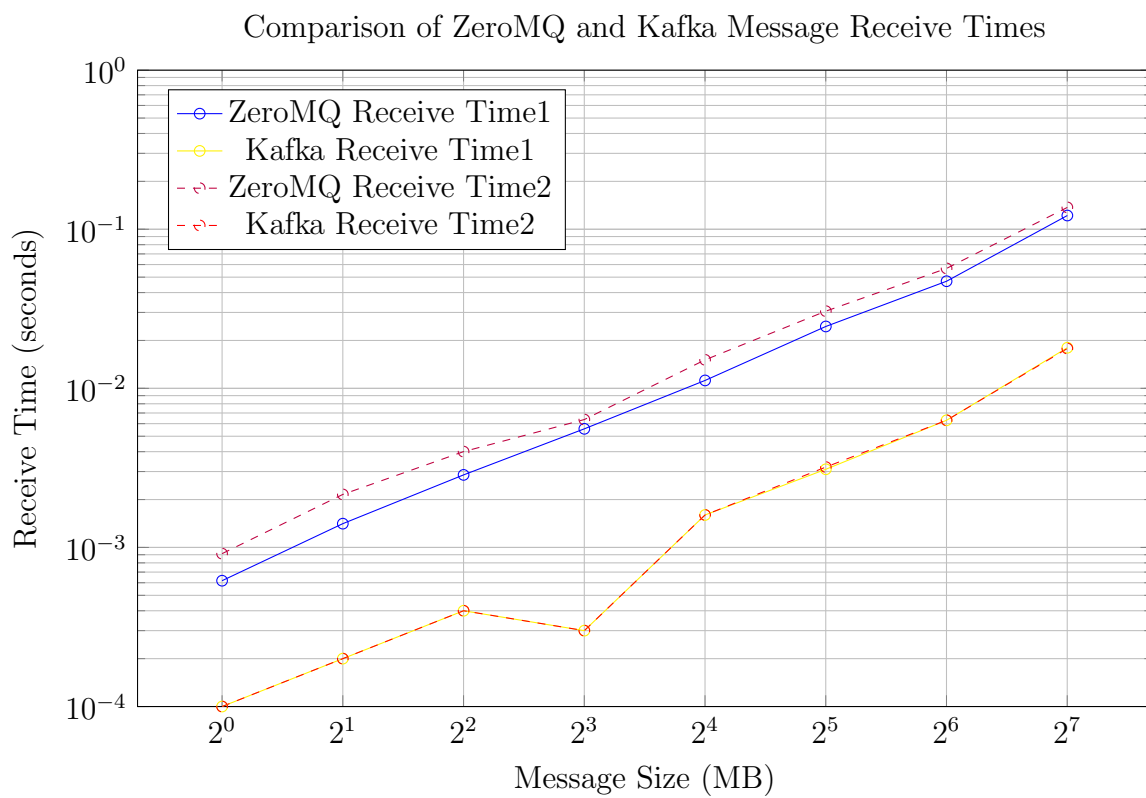


Figure 5: Comparison of ZeroMQ and Kafka Message Receive Times