Report

Screenshots:

(1)Size of array is 2000

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Please input the size of the array:
2000
====Size of array:2000, Max threads:64, Cutoff:1000====
Parallel sort took 15577 ns

====Size of array:2000, Max threads:128, Cutoff:1000====
Parallel sort took 889 ns

====Size of array:2000, Max threads:256, Cutoff:1000====
Parallel sort took 967 ns

====Size of array:2000, Max threads:512, Cutoff:1000====
Parallel sort took 893 ns

====Size of array:2000, Max threads:1024, Cutoff:1000===
Parallel sort took 1017 ns

====Size of array:2000, Max threads:64, Cutoff:500====
Parallel sort took 912 ns

====Size of array:2000, Max threads:128, Cutoff:500====
Parallel sort took 771 ns

====Size of array:2000, Max threads:256, Cutoff:500====
Parallel sort took 874 ns

====Size of array:2000, Max threads:512, Cutoff:500====
Parallel sort took 808 ns

====Size of array:2000, Max threads:1024, Cutoff:500====
Parallel sort took 756 ns

====Size of array:2000, Max threads:64, Cutoff:250====
Parallel sort took 919 ns

====Size of array:2000, Max threads:128, Cutoff:250====
Parallel sort took 807 ns

====Size of array:2000, Max threads:256, Cutoff:250====
Parallel sort took 844 ns
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====Size of array:2000, Max threads:512, Cutoff:250====
Parallel sort took 939 ns

====Size of array:2000, Max threads:1024, Cutoff:250====
Parallel sort took 1078 ns

====Size of array:2000, Max threads:64, Cutoff:125====
Parallel sort took 782 ns

====Size of array:2000, Max threads:128, Cutoff:125====
Parallel sort took 829 ns

====Size of array:2000, Max threads:256, Cutoff:125====
Parallel sort took 842 ns

====Size of array:2000, Max threads:512, Cutoff:125====
Parallel sort took 826 ns

====Size of array:2000, Max threads:1024, Cutoff:125====
Parallel sort took 813 ns

====Size of array:2000, Max threads:64, Cutoff:62====
Parallel sort took 982 ns

====Size of array:2000, Max threads:128, Cutoff:62====
Parallel sort took 813 ns

====Size of array:2000, Max threads:256, Cutoff:62====
Parallel sort took 847 ns

====Size of array:2000, Max threads:512, Cutoff:62====
Parallel sort took 812 ns

====Size of array:2000, Max threads:1024, Cutoff:62====
Parallel sort took 788 ns
```

Size of array is 10000

```
Please input the size of the array:
10000
====Size of array:10000, Max threads:512, Cutoff:5000====
Parallel sort took 66301 ns

====Size of array:10000, Max threads:1024, Cutoff:5000====
Parallel sort took 22230 ns

====Size of array:10000, Max threads:2048, Cutoff:5000====
Parallel sort took 20390 ns

====Size of array:10000, Max threads:4096, Cutoff:5000====
Parallel sort took 38518 ns

====Size of array:10000, Max threads:8192, Cutoff:5000====
Parallel sort took 43681 ns

====Size of array:10000, Max threads:512, Cutoff:2500====
Parallel sort took 21129 ns

====Size of array:10000, Max threads:1024, Cutoff:2500====
Parallel sort took 22038 ns

====Size of array:10000, Max threads:2048, Cutoff:2500====
Parallel sort took 21142 ns

====Size of array:10000, Max threads:4096, Cutoff:2500====
Parallel sort took 21355 ns

====Size of array:10000, Max threads:8192, Cutoff:2500====
Parallel sort took 24072 ns

====Size of array:10000, Max threads:512, Cutoff:1250====
Parallel sort took 22742 ns

====Size of array:10000, Max threads:1024, Cutoff:1250====
Parallel sort took 21365 ns

====Size of array:10000, Max threads:2048, Cutoff:1250====
Parallel sort took 21521 ns
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```
====Size of array:10000, Max threads:4096, Cutoff:1250====
Parallel sort took 22203 ns

====Size of array:10000, Max threads:8192, Cutoff:1250====
Parallel sort took 20847 ns

====Size of array:10000, Max threads:512, Cutoff:625====
Parallel sort took 21028 ns

====Size of array:10000, Max threads:1024, Cutoff:625====
Parallel sort took 22729 ns

====Size of array:10000, Max threads:2048, Cutoff:625====
Parallel sort took 22162 ns

====Size of array:10000, Max threads:4096, Cutoff:625====
Parallel sort took 23830 ns

====Size of array:10000, Max threads:8192, Cutoff:625====
Parallel sort took 22066 ns

====Size of array:10000, Max threads:512, Cutoff:312====
Parallel sort took 22282 ns

====Size of array:10000, Max threads:1024, Cutoff:312====
Parallel sort took 21687 ns

====Size of array:10000, Max threads:2048, Cutoff:312====
Parallel sort took 22569 ns

====Size of array:10000, Max threads:4096, Cutoff:312====
Parallel sort took 21705 ns

====Size of array:10000, Max threads:8192, Cutoff:312====
Parallel sort took 23656 ns
```

(3)Size of array is 20000

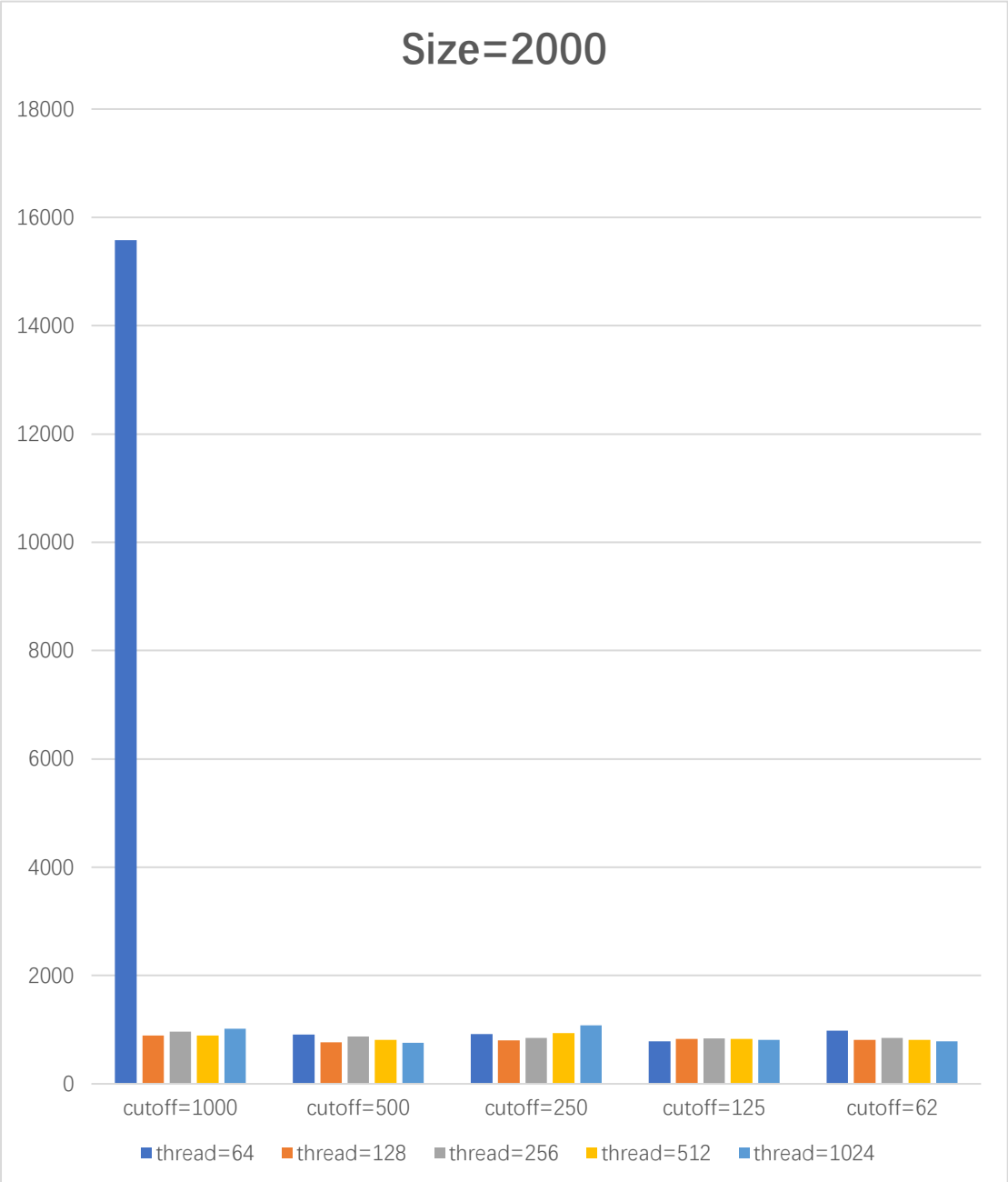
```
Please input the size of the array:
20000
====Size of array:20000, Max threads:1024, Cutoff:10000===
Parallel sort took 41871 ns

====Size of array:20000, Max threads:2048, Cutoff:10000===
Parallel sort took 8363 ns

====Size of array:20000, Max threads:4096, Cutoff:10000===
Parallel sort took 23672 ns

====Size of array:20000, Max threads:8192, Cutoff:10000===
Parallel sort took 113968 ns

====Size of array:20000, Max threads:16384, Cutoff:10000==
Parallel sort took 79354 ns

====Size of array:20000, Max threads:1024, Cutoff:5000====
Parallel sort took 8098 ns

====Size of array:20000, Max threads:2048, Cutoff:5000====
Parallel sort took 8444 ns

====Size of array:20000, Max threads:4096, Cutoff:5000====
Parallel sort took 8724 ns

====Size of array:20000, Max threads:8192, Cutoff:5000====
Parallel sort took 8019 ns

====Size of array:20000, Max threads:16384, Cutoff:5000===
Parallel sort took 8139 ns

====Size of array:20000, Max threads:1024, Cutoff:2500====
Parallel sort took 9099 ns

====Size of array:20000, Max threads:2048, Cutoff:2500====
Parallel sort took 8315 ns

====Size of array:20000, Max threads:4096, Cutoff:2500====
Parallel sort took 8882 ns
```

```
====Size of array:20000, Max threads:8192, Cutoff:2500====
Parallel sort took 8118 ns

====Size of array:20000, Max threads:16384, Cutoff:2500====
Parallel sort took 8026 ns

====Size of array:20000, Max threads:1024, Cutoff:1250====
Parallel sort took 8156 ns

====Size of array:20000, Max threads:2048, Cutoff:1250====
Parallel sort took 8856 ns

====Size of array:20000, Max threads:4096, Cutoff:1250====
Parallel sort took 8253 ns

====Size of array:20000, Max threads:8192, Cutoff:1250====
Parallel sort took 8187 ns

====Size of array:20000, Max threads:16384, Cutoff:1250====
Parallel sort took 8113 ns

====Size of array:20000, Max threads:1024, Cutoff:625====
Parallel sort took 8041 ns

====Size of array:20000, Max threads:2048, Cutoff:625====
Parallel sort took 8022 ns

====Size of array:20000, Max threads:4096, Cutoff:625====
Parallel sort took 8243 ns

====Size of array:20000, Max threads:8192, Cutoff:625====
Parallel sort took 8139 ns

====Size of array:20000, Max threads:16384, Cutoff:625====
Parallel sort took 8000 ns
```

Comparison:

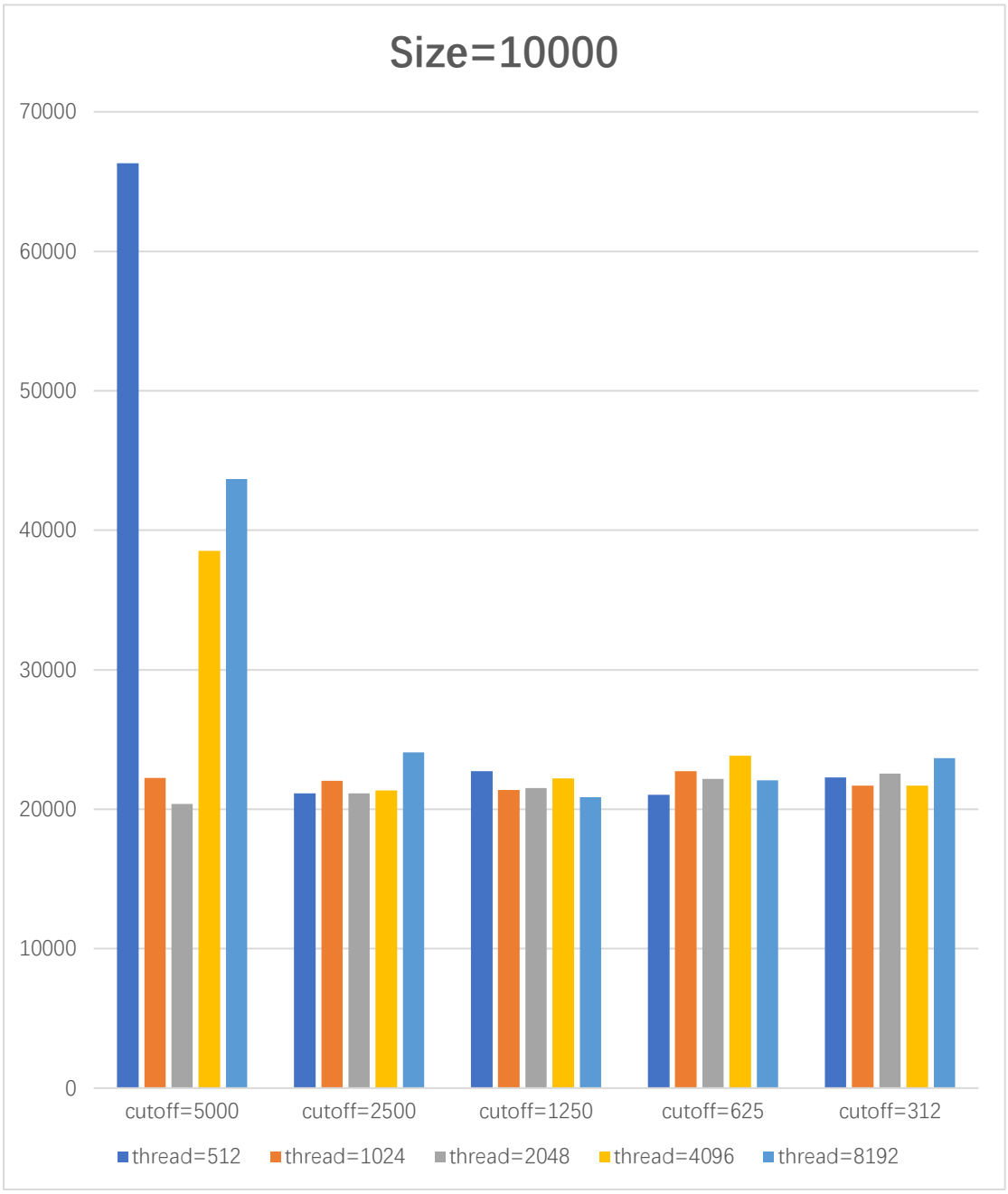
1. Size=2000(ns)

Max threads / Cutoff	64	128	256	512	1024
1000	15577	889	967	893	1017
500	912	771	874	808	756
250	919	807	844	939	1078
125	782	829	842	826	813
62	982	813	847	812	788



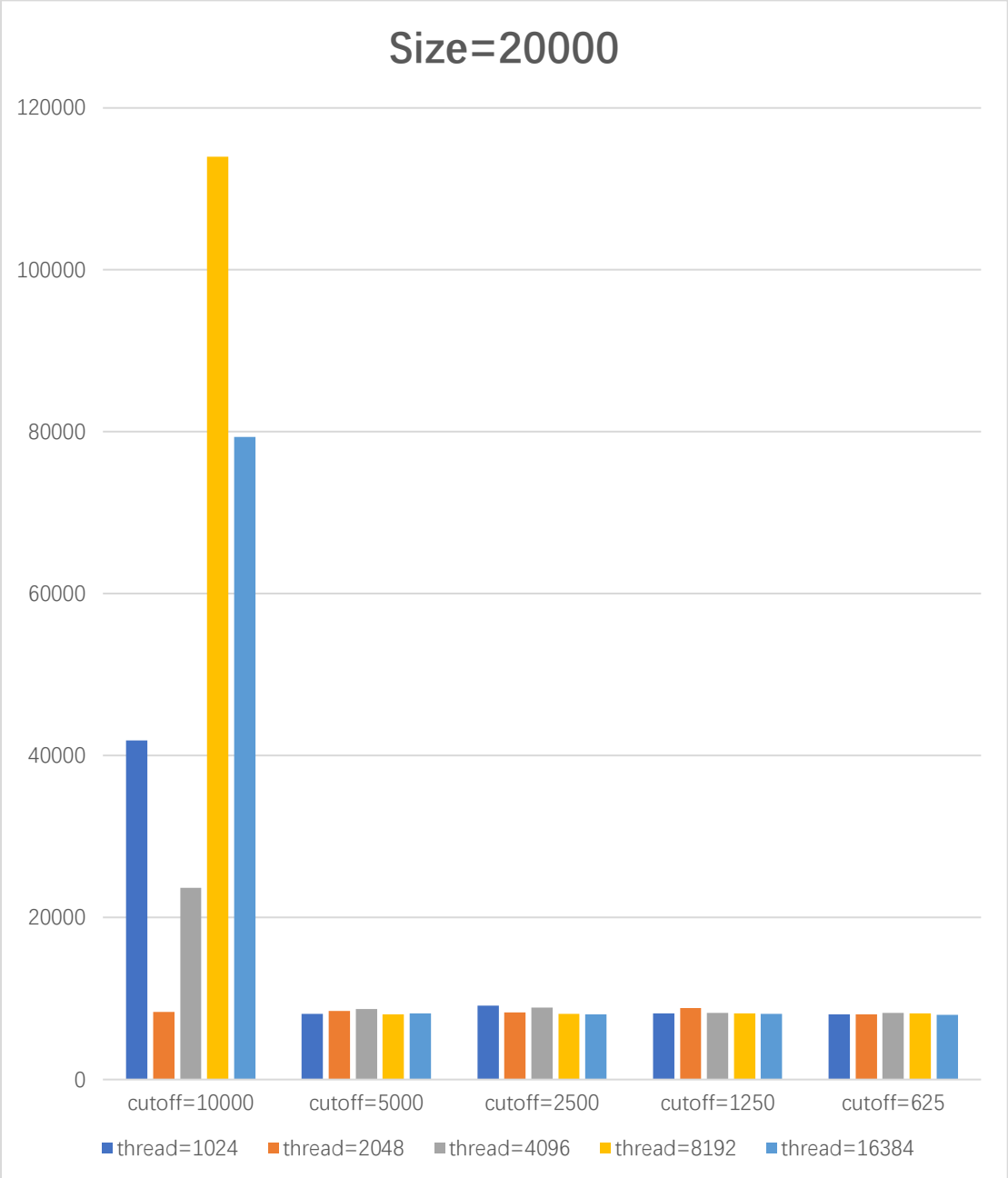
2. Size=10000(ns)

Max threads / Cutoff	512	1024	2048	4096	8192
5000	66301	22230	20390	38518	43681
2500	21129	22038	21142	21355	24072
1250	22742	21365	21521	22203	20847
625	21028	22729	22162	23830	22066
312	22282	21687	22569	21705	23656



3. Size=20000(ns)

Cutoff \ Max threads	1024	2048	4096	8192	16384
10000	41871	8363	23672	113968	79354
5000	8098	8444	8724	8019	8139
2500	9099	8315	8882	8118	8026
1250	8156	8856	8253	8187	8113
625	8041	8022	8243	8139	8000



Conclusion:

As can be seen from above, the efficiency of parsort is relevant to size of the array, max threads and cutoff.