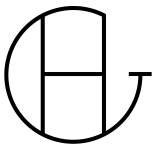

HoGent

Faculteit Bedrijf en Organisatie

Research of caching strategies in mobile native applications using external data services

Bijlagen

Frederik De Smedt

Scriptie voorgedragen tot het bekomen van de graad van
Bachelor in de toegepaste informatica

Promotor:
Joeri Van Herreweghe
Co-promotor:
Jens Buysse

Instelling: —

Academiejaar: 2015-2016

Tweede examenperiode

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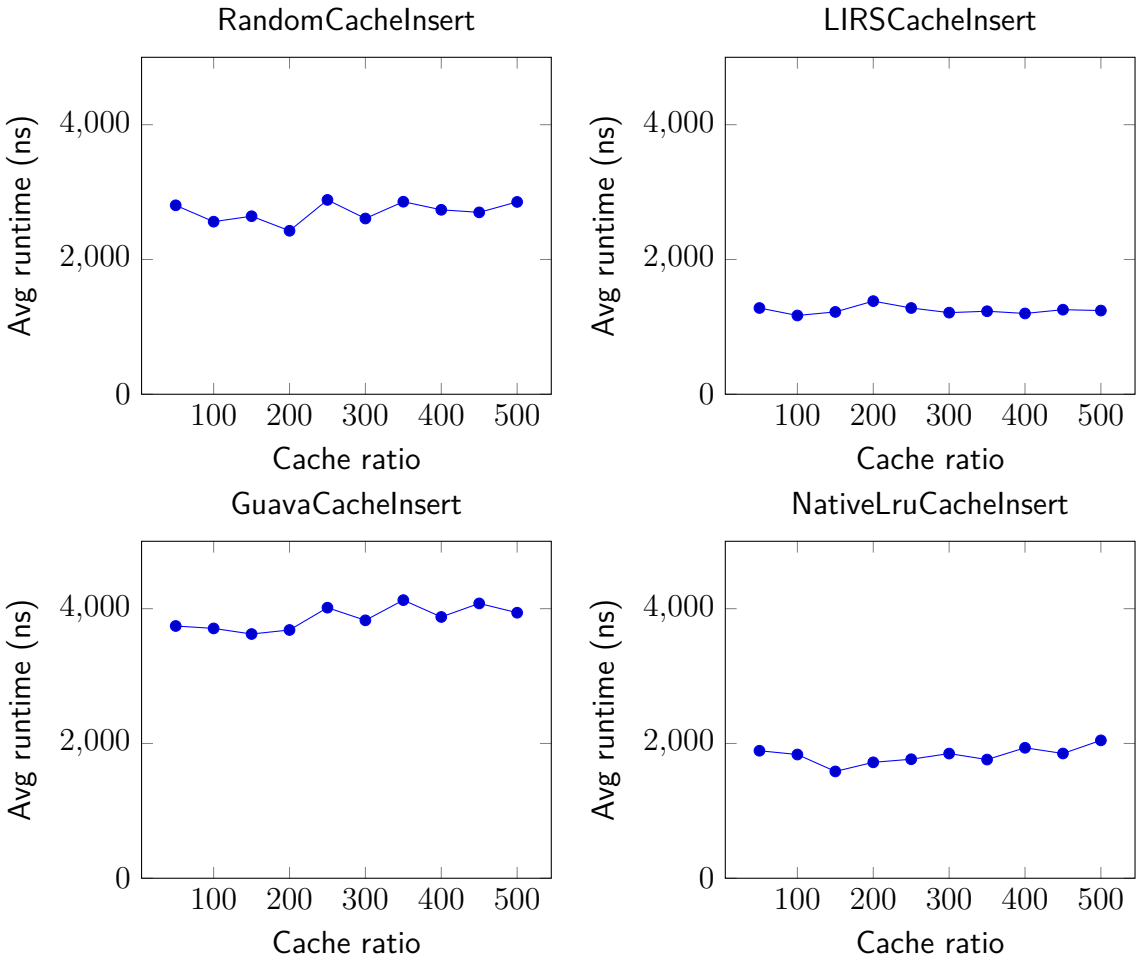
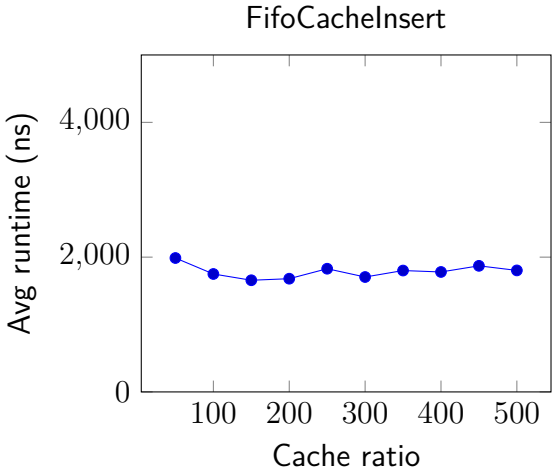
Appendices

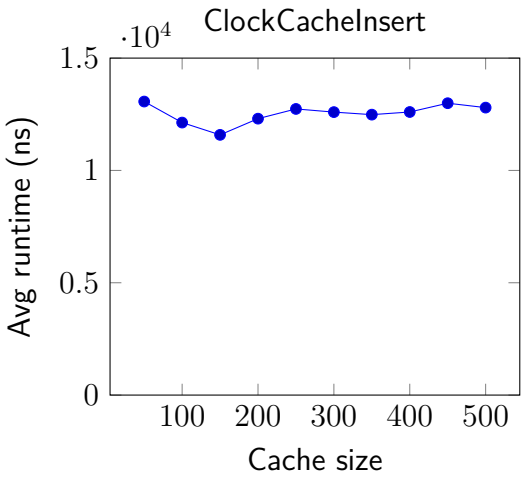
Appendix A

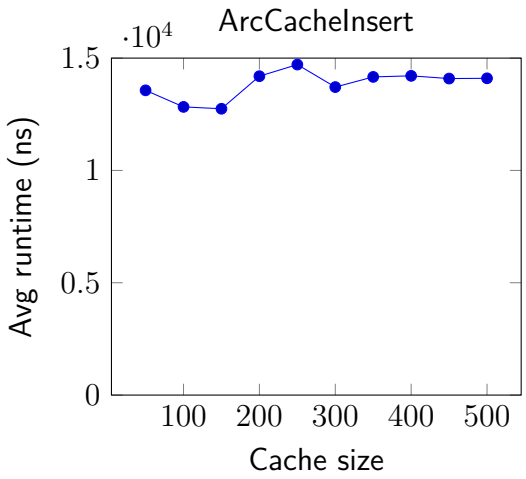
Insert benchmarks





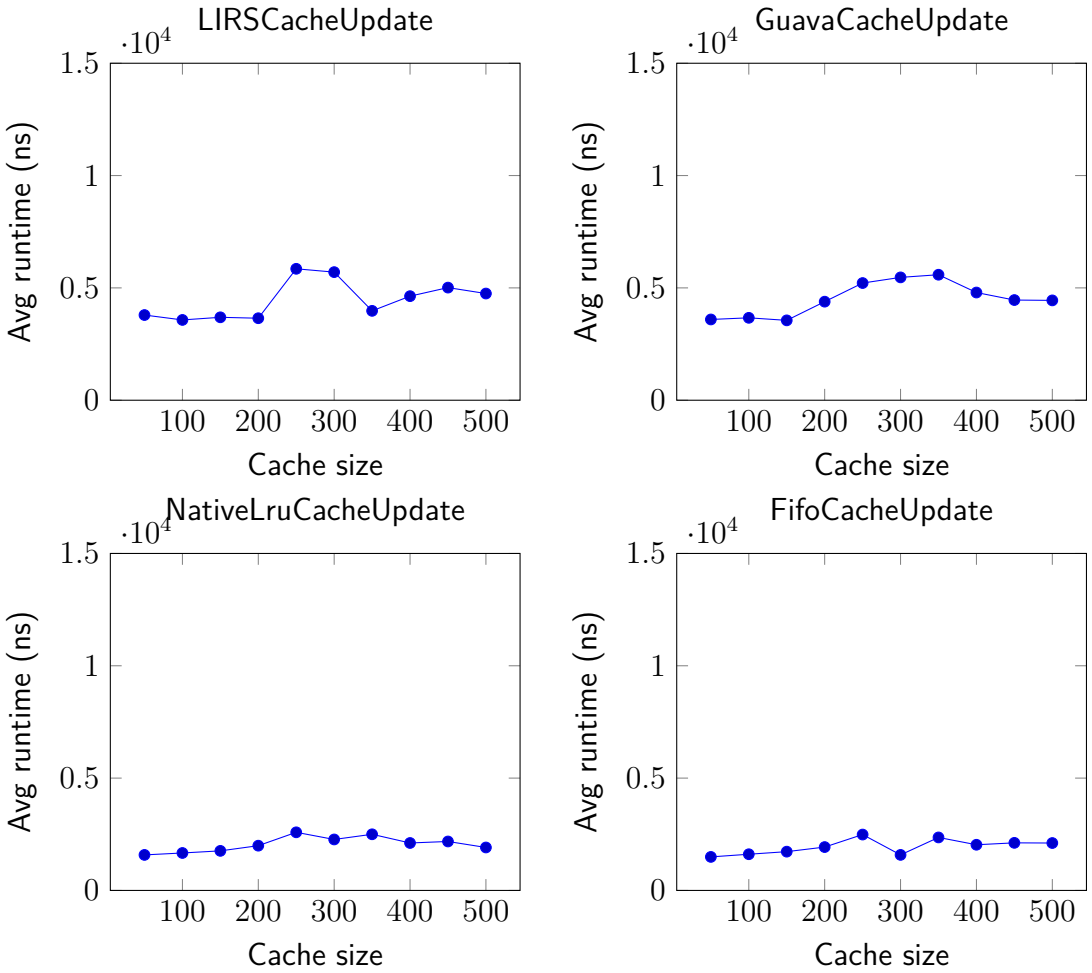
These benchmarks have an average execution time above 5000 ns. Due to the scale difference they are placed separately.

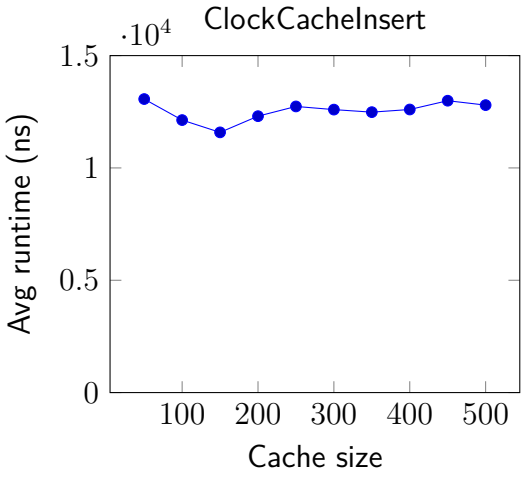


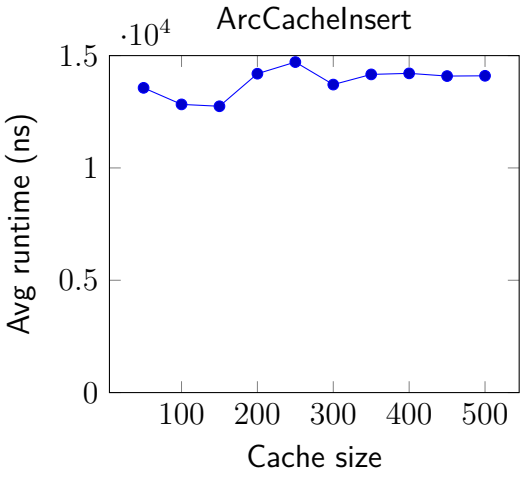


Appendix B

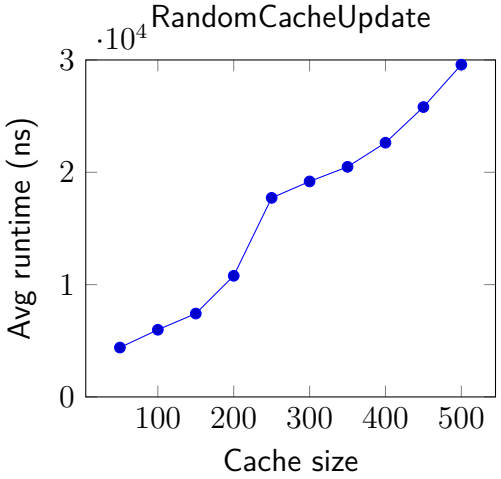
Update benchmarks





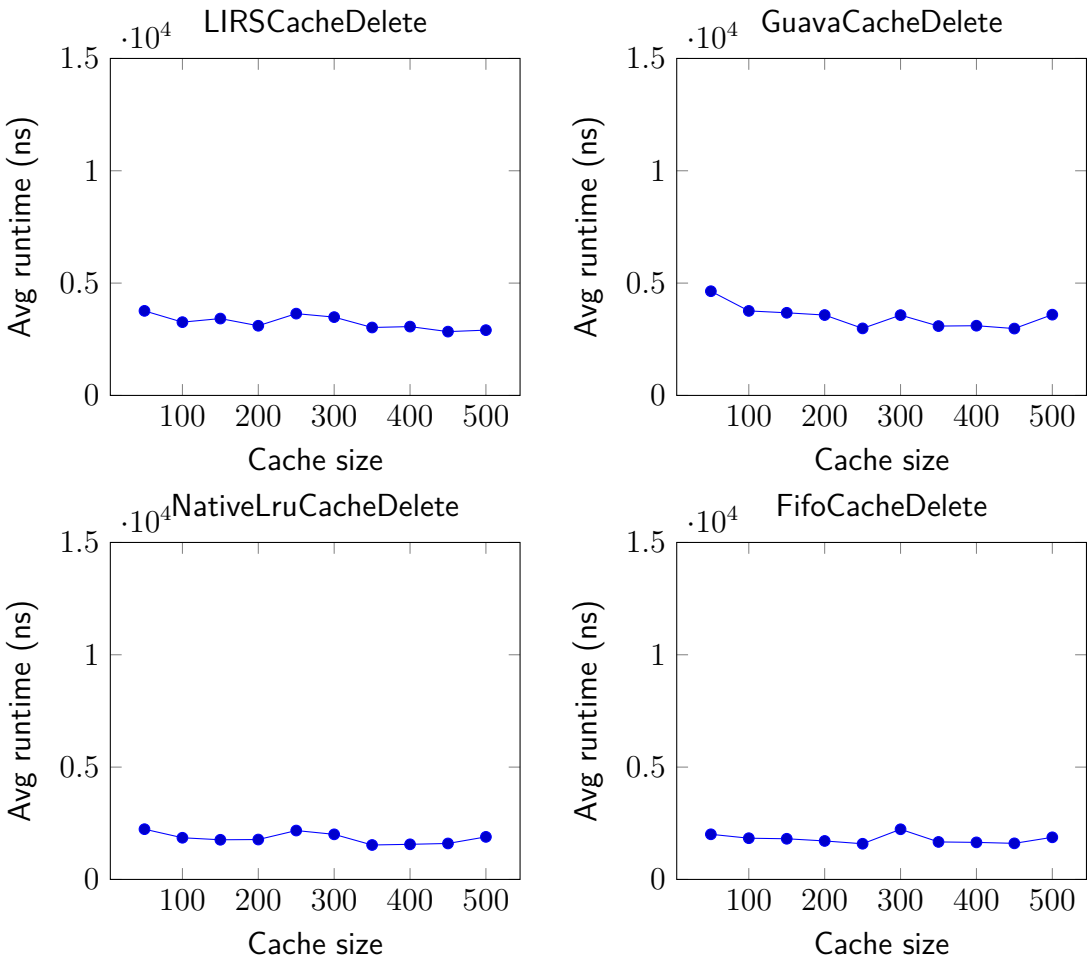


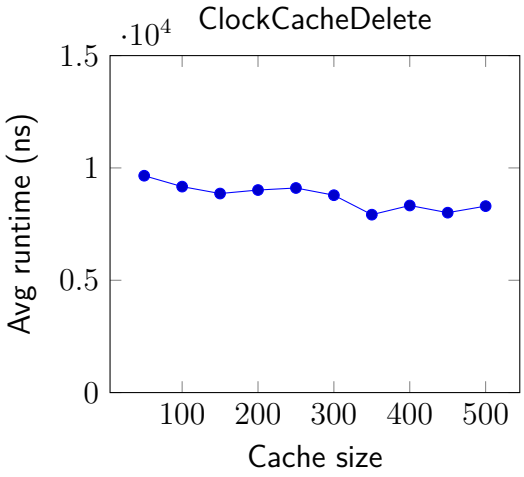
Due to the linear fashion of a random cache update, random cache is placed separately and has a different scale.

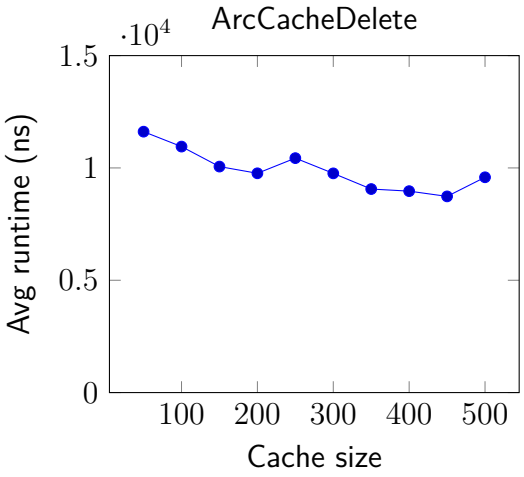


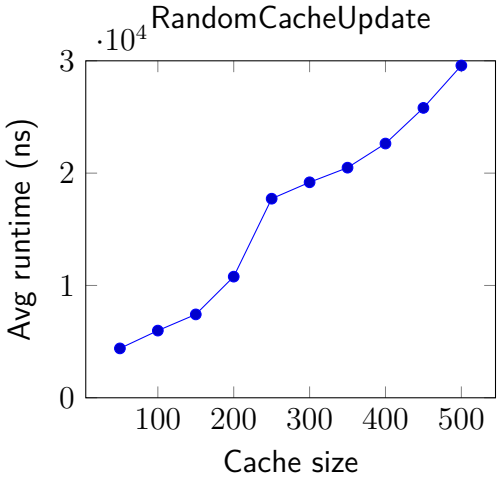
Appendix C

Delete benchmarks



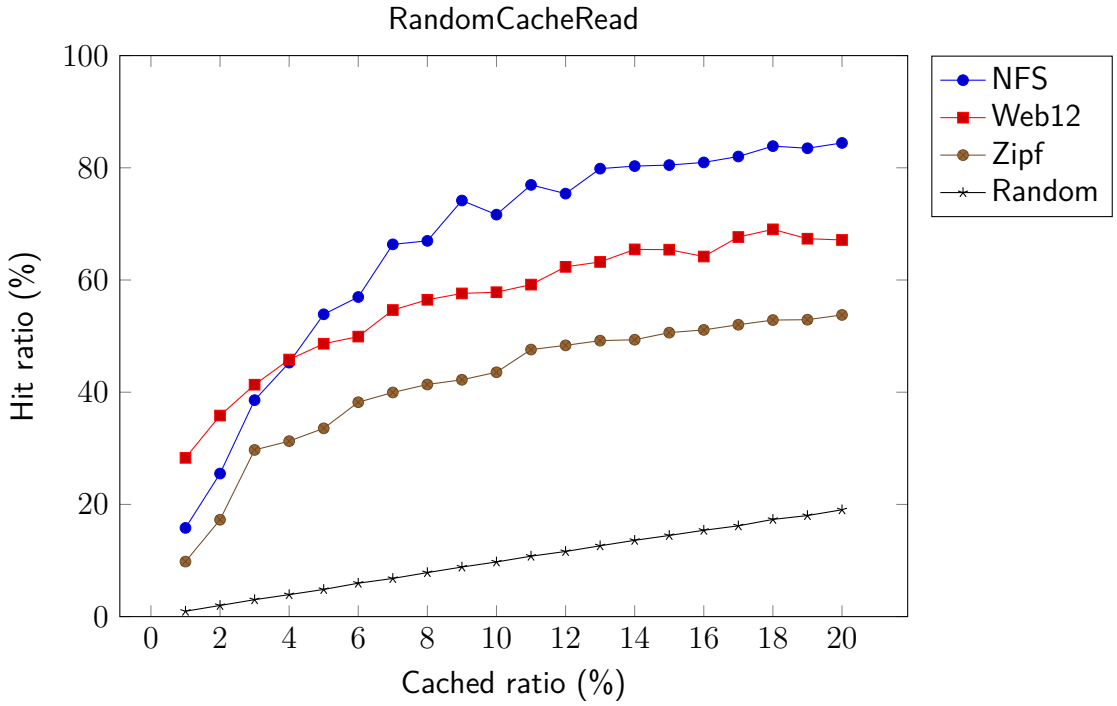

ClockCacheDelete
$\cdot 10^4$
1.5
1
0.5
0
Avg runtime (ns)
100
200
300
400
500
Cache size

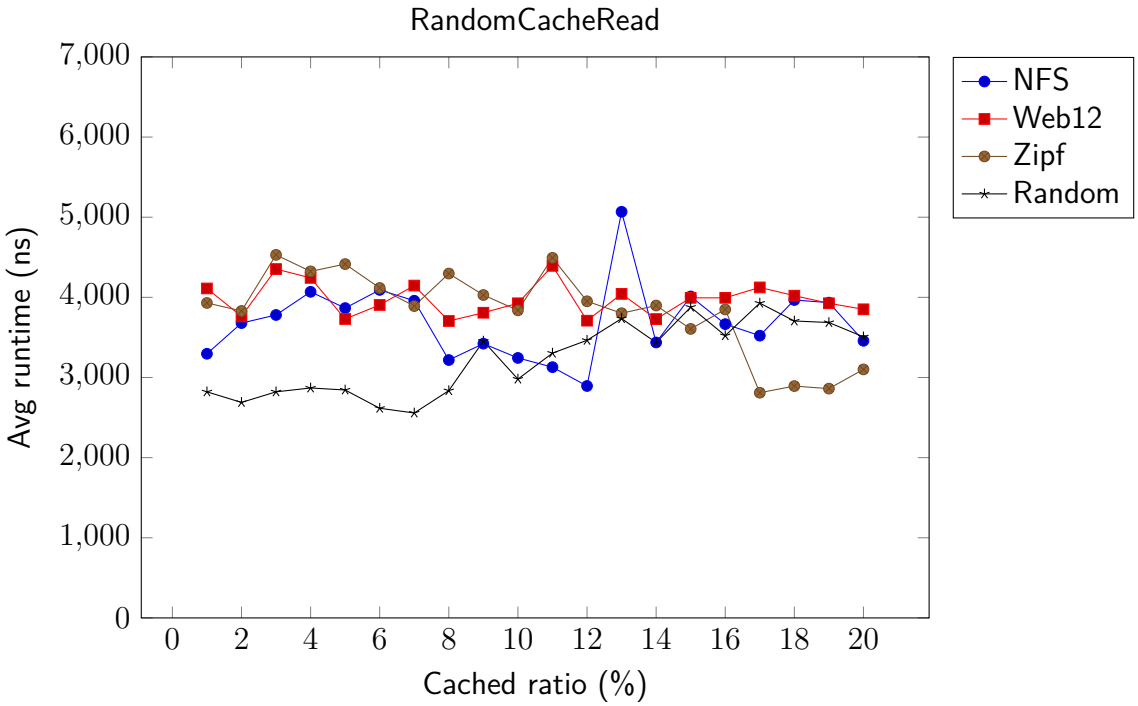

ArcCacheDelete
$\cdot 10^4$
1.5
1
0.5
0
Avg runtime (ns)
100
200
300
400
500
Cache size

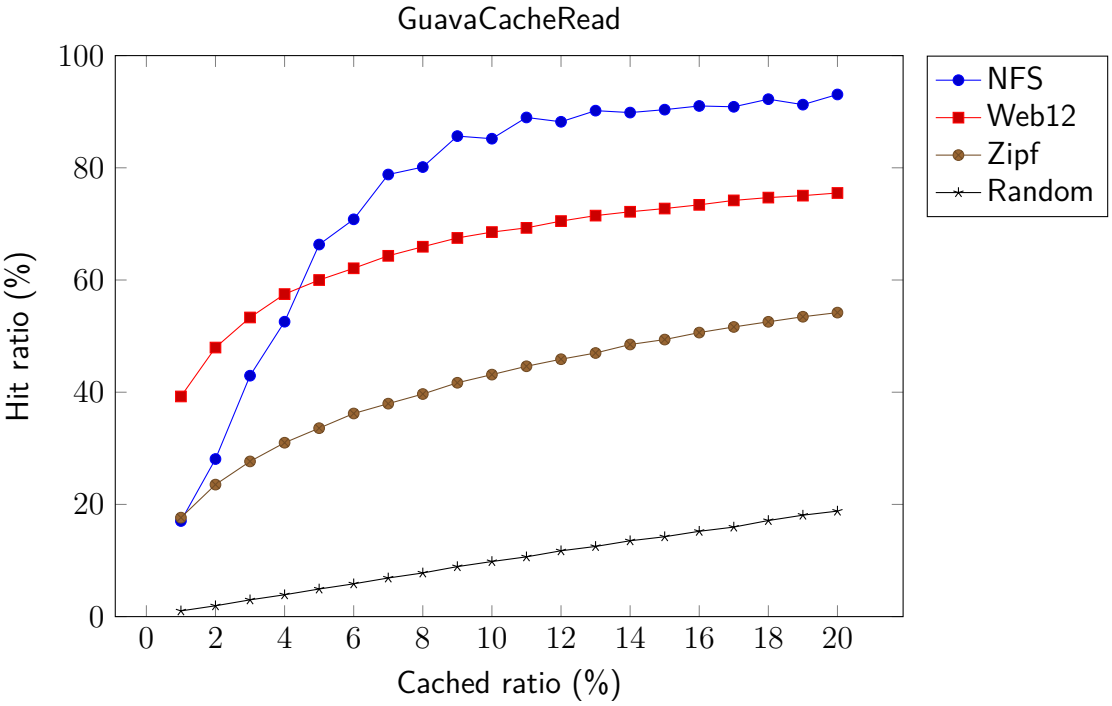

RandomCacheUpdate
$\cdot 10^4$
3
2
1
0
Avg runtime (ns)
100
200
300
400
500
Cache size

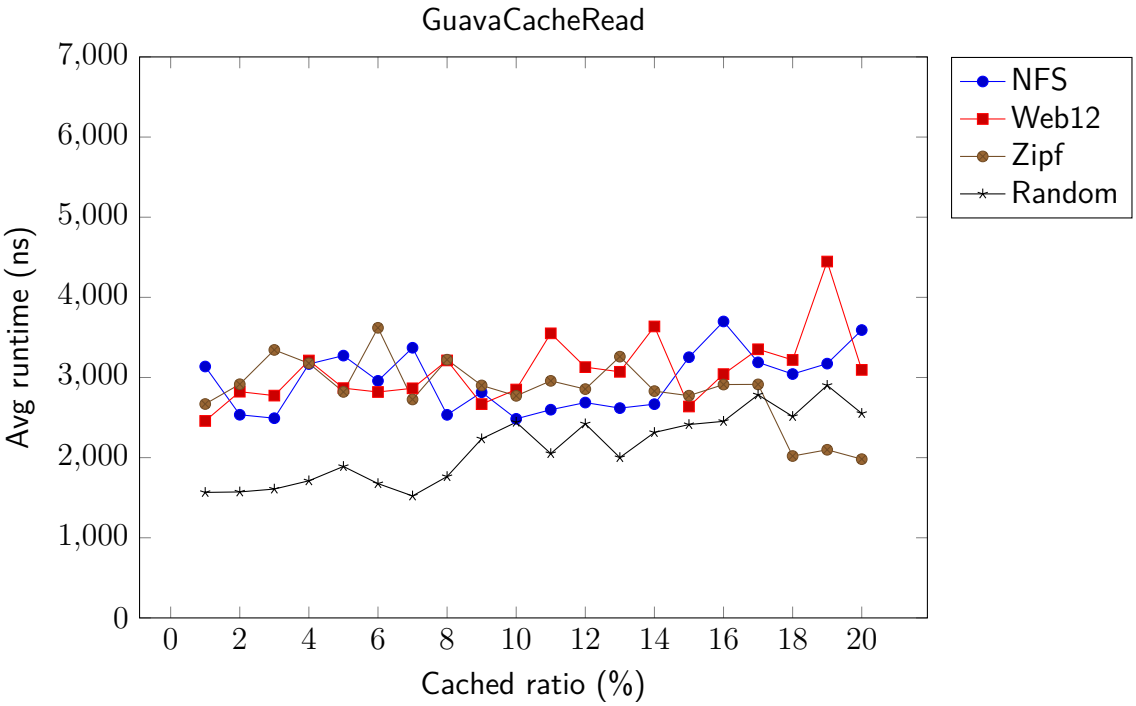
Appendix D

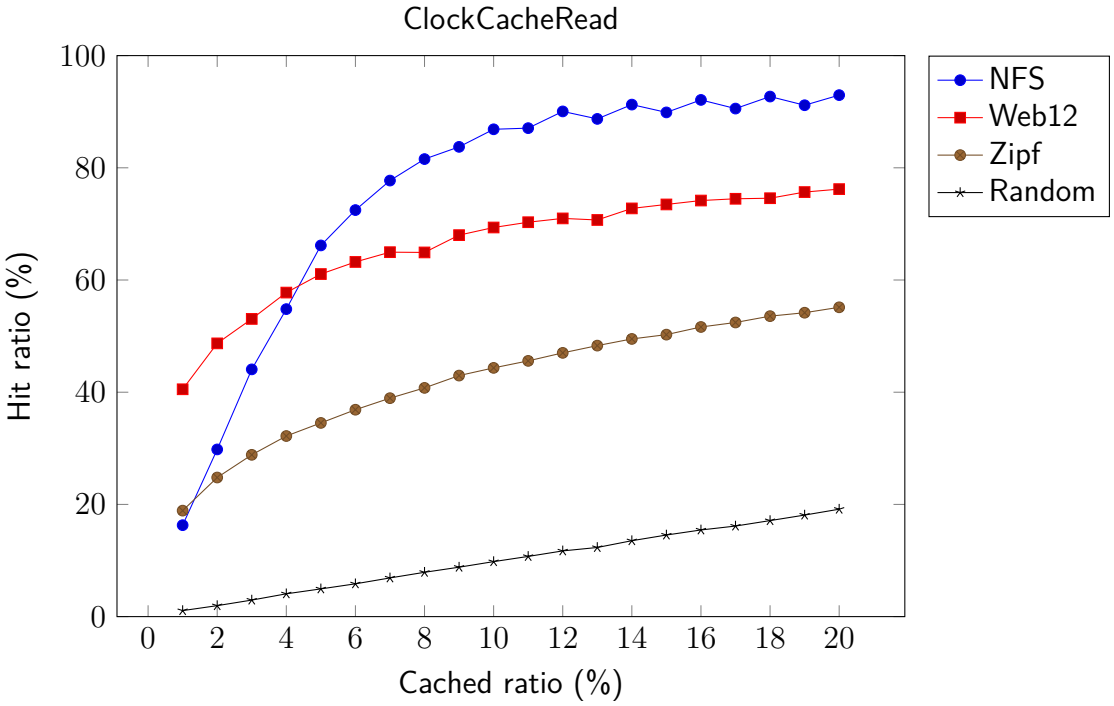
Read benchmarks

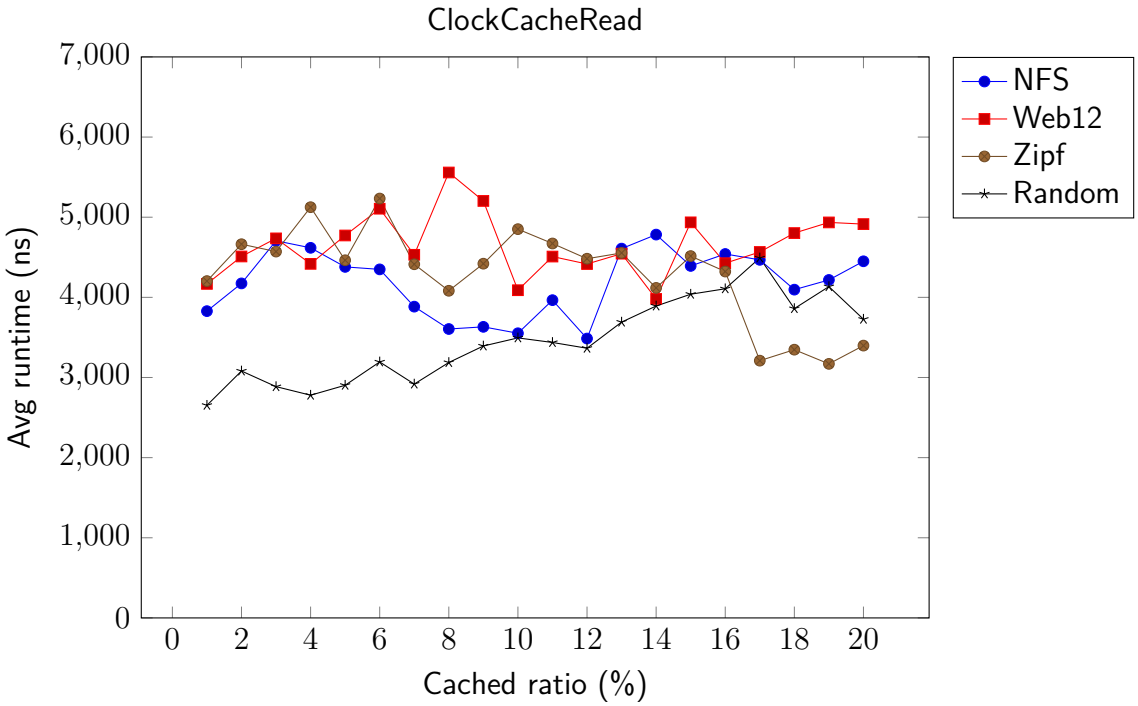

RandomCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

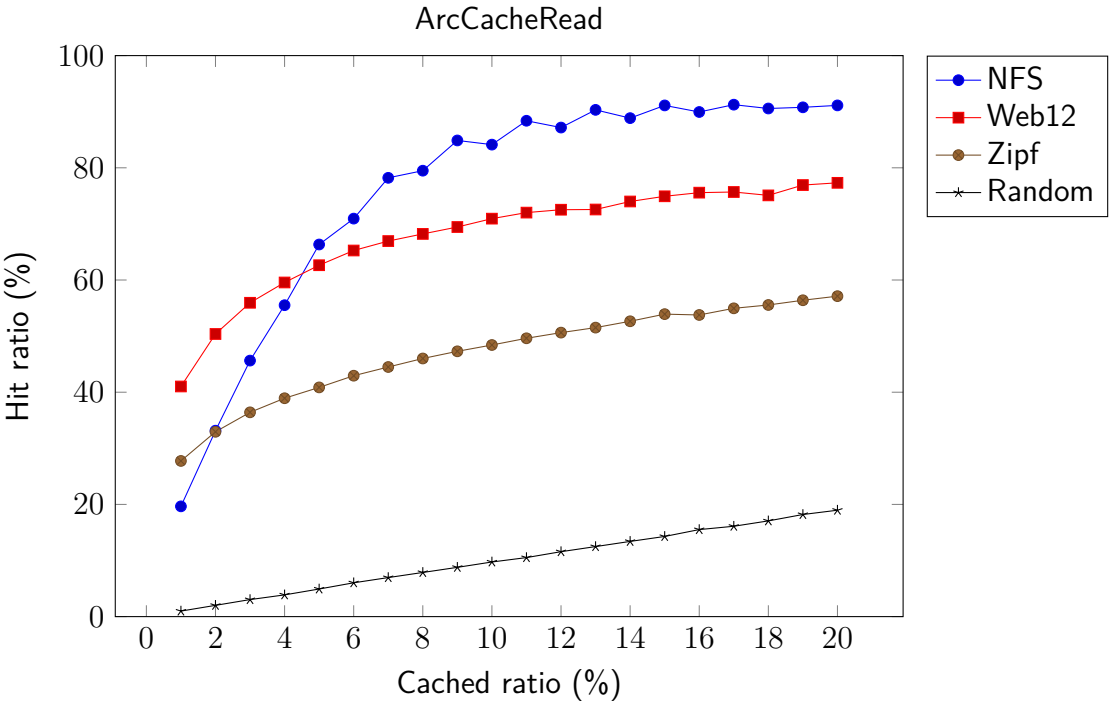

RandomCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

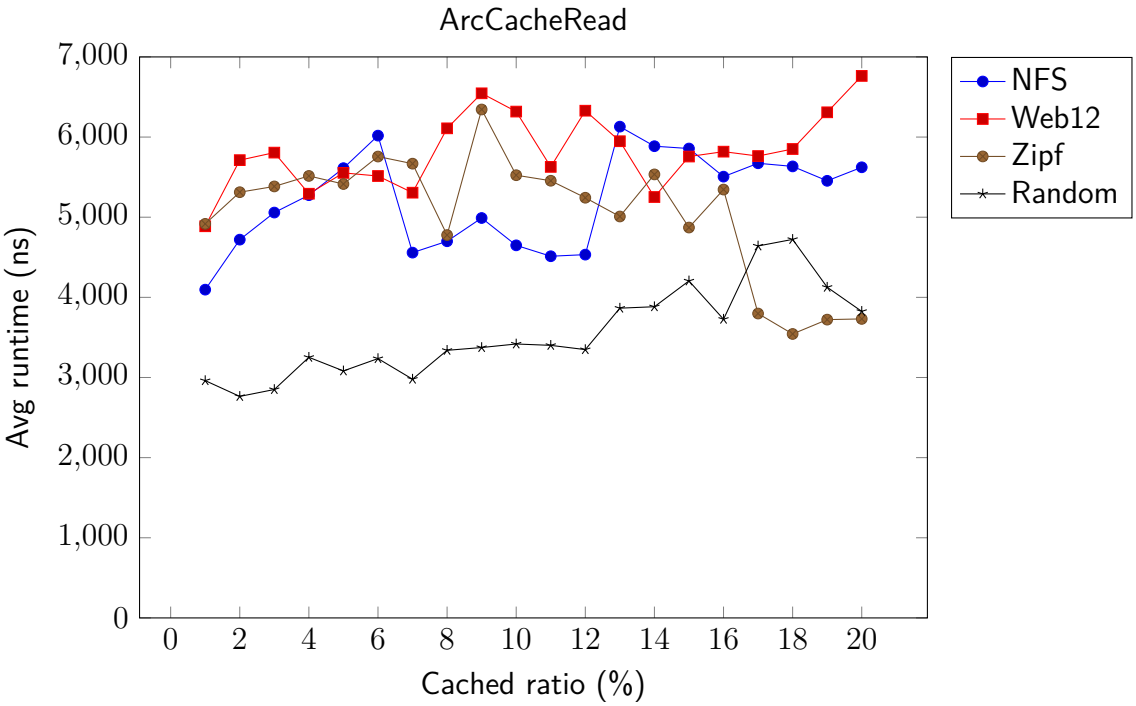

GuavaCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

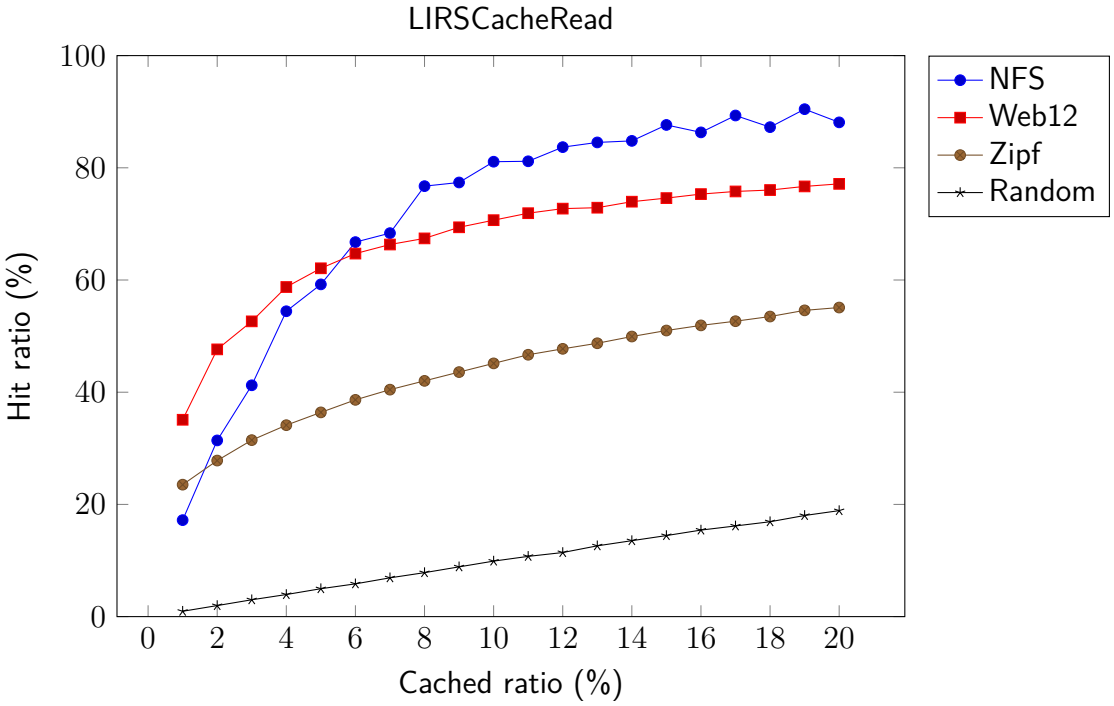

GuavaCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

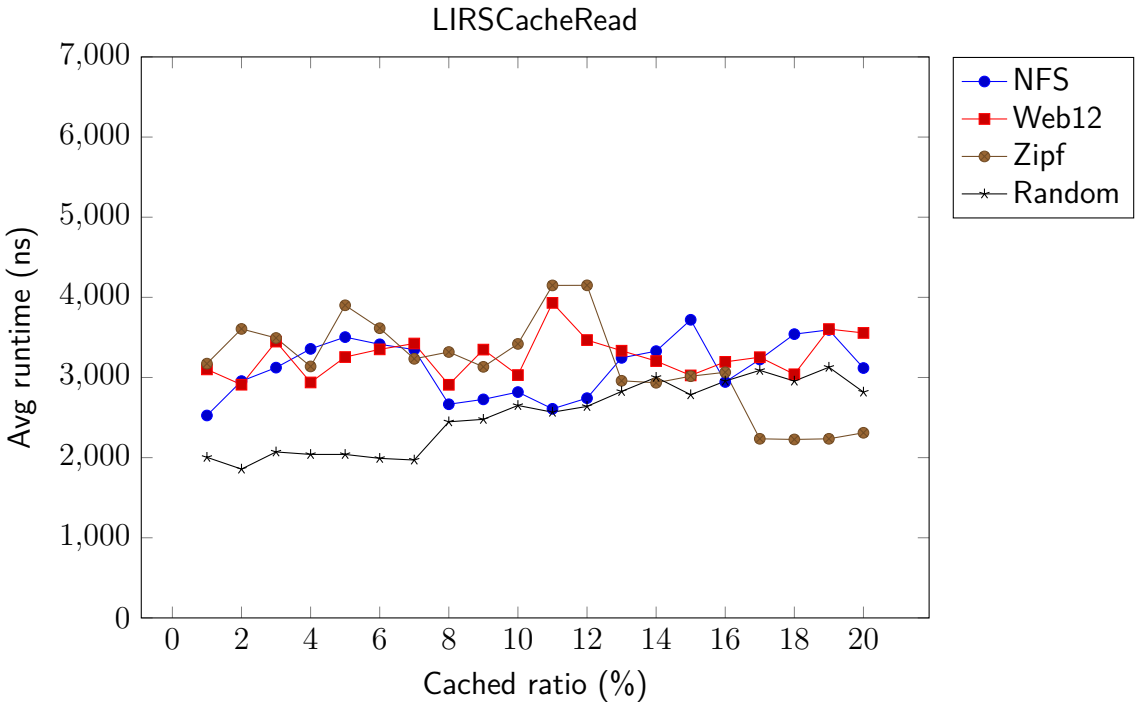

ClockCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

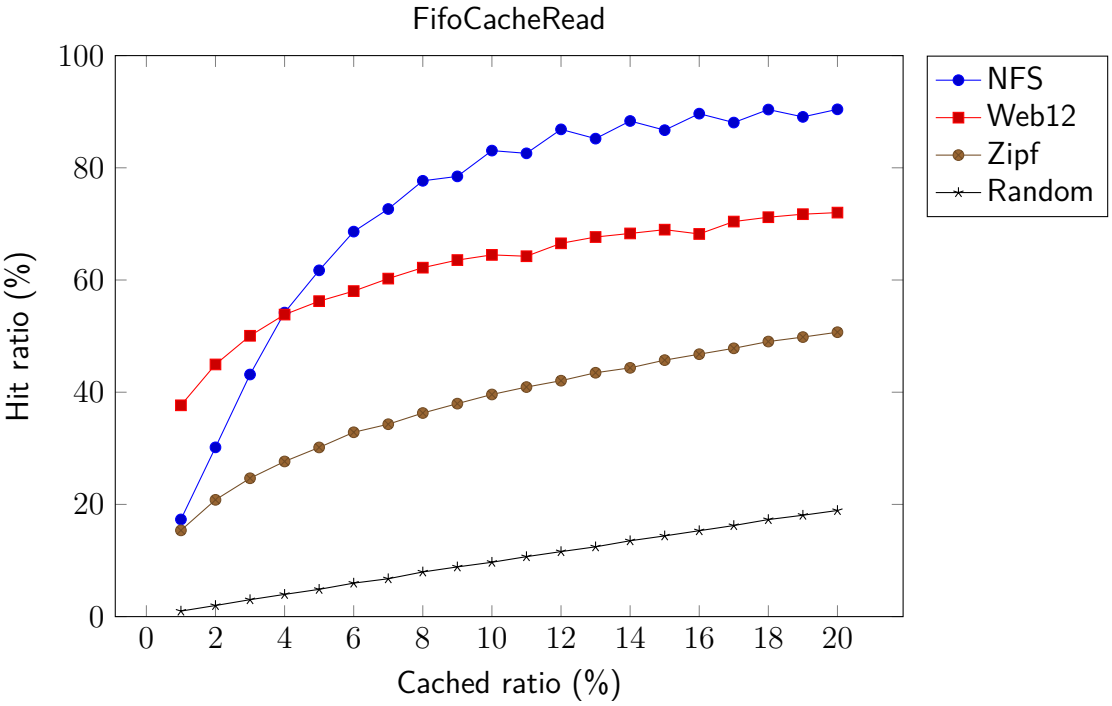

ClockCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

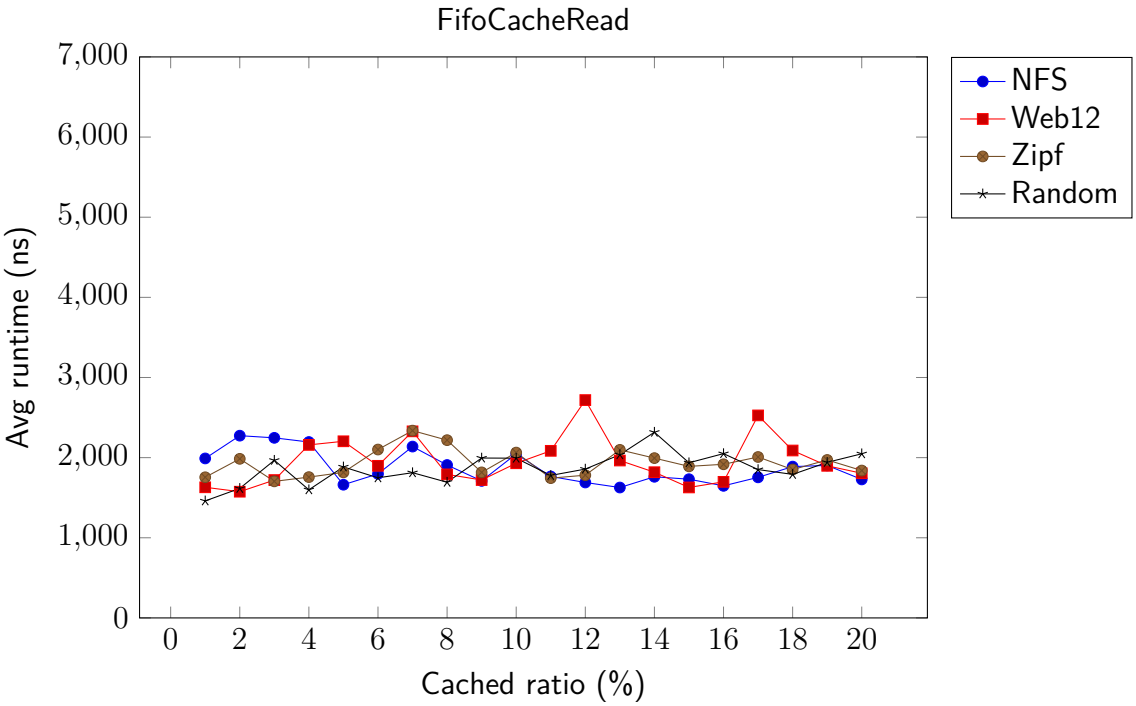

ArcCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

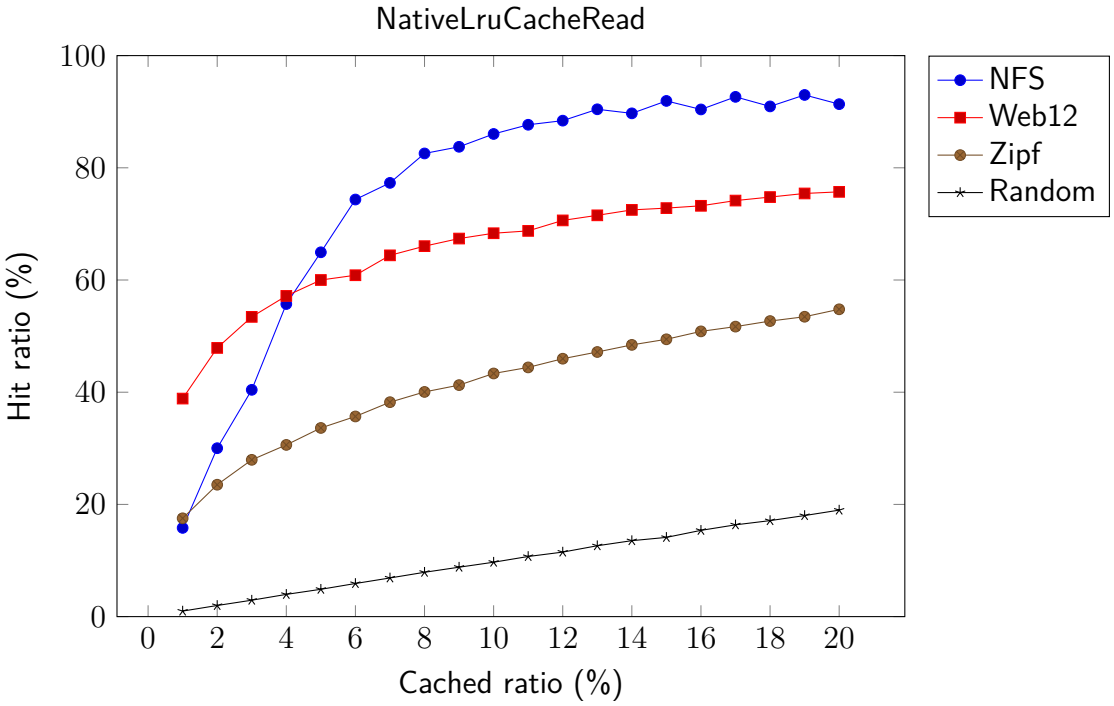

ArcCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

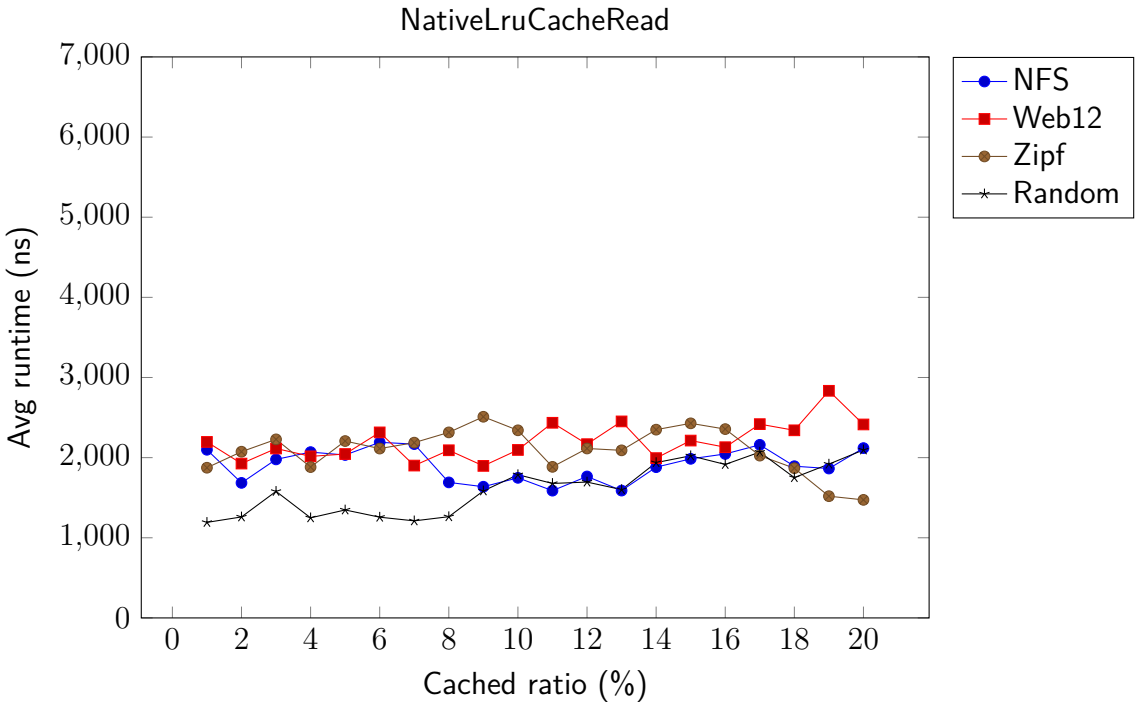

LIRSCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

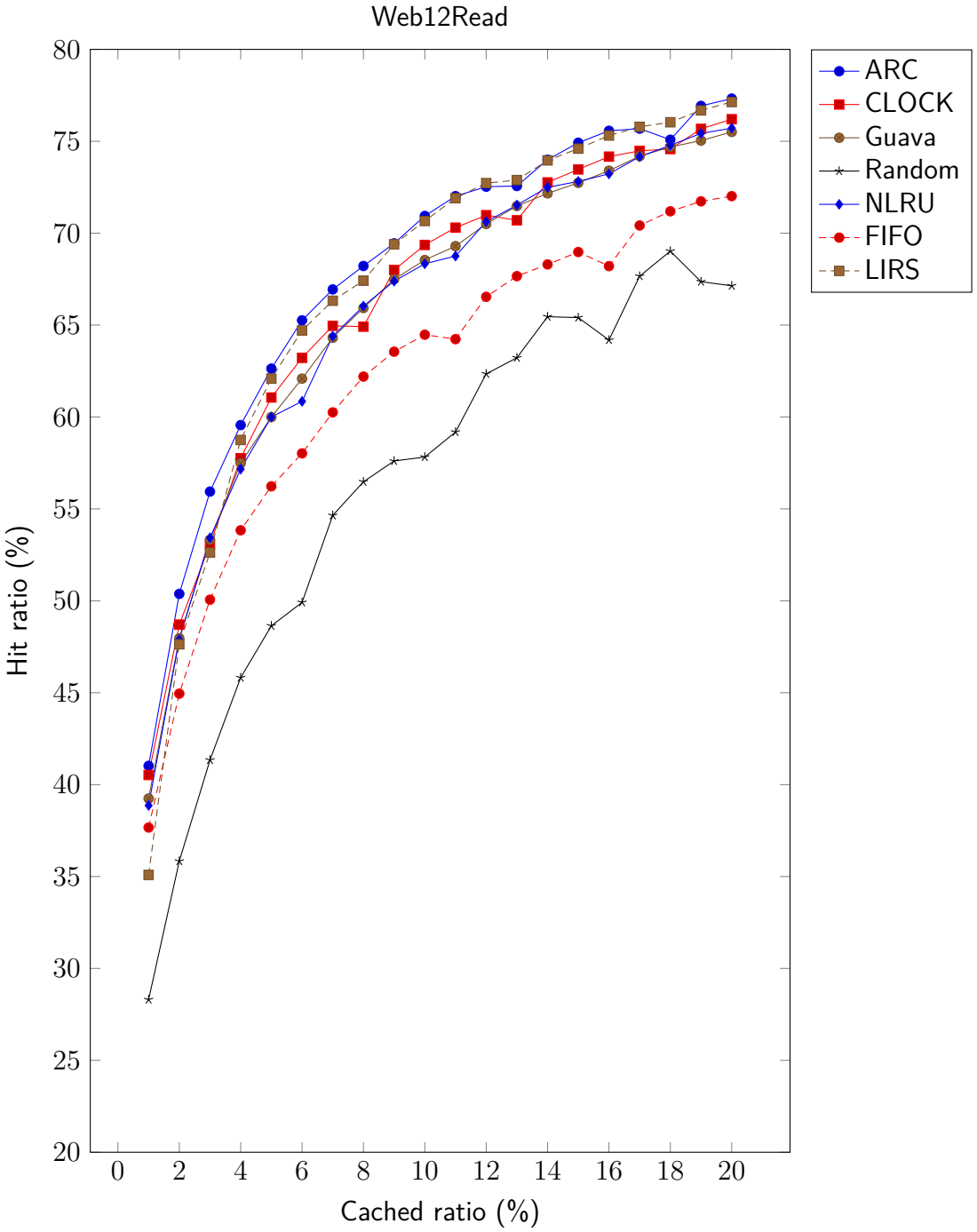

LIRSCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

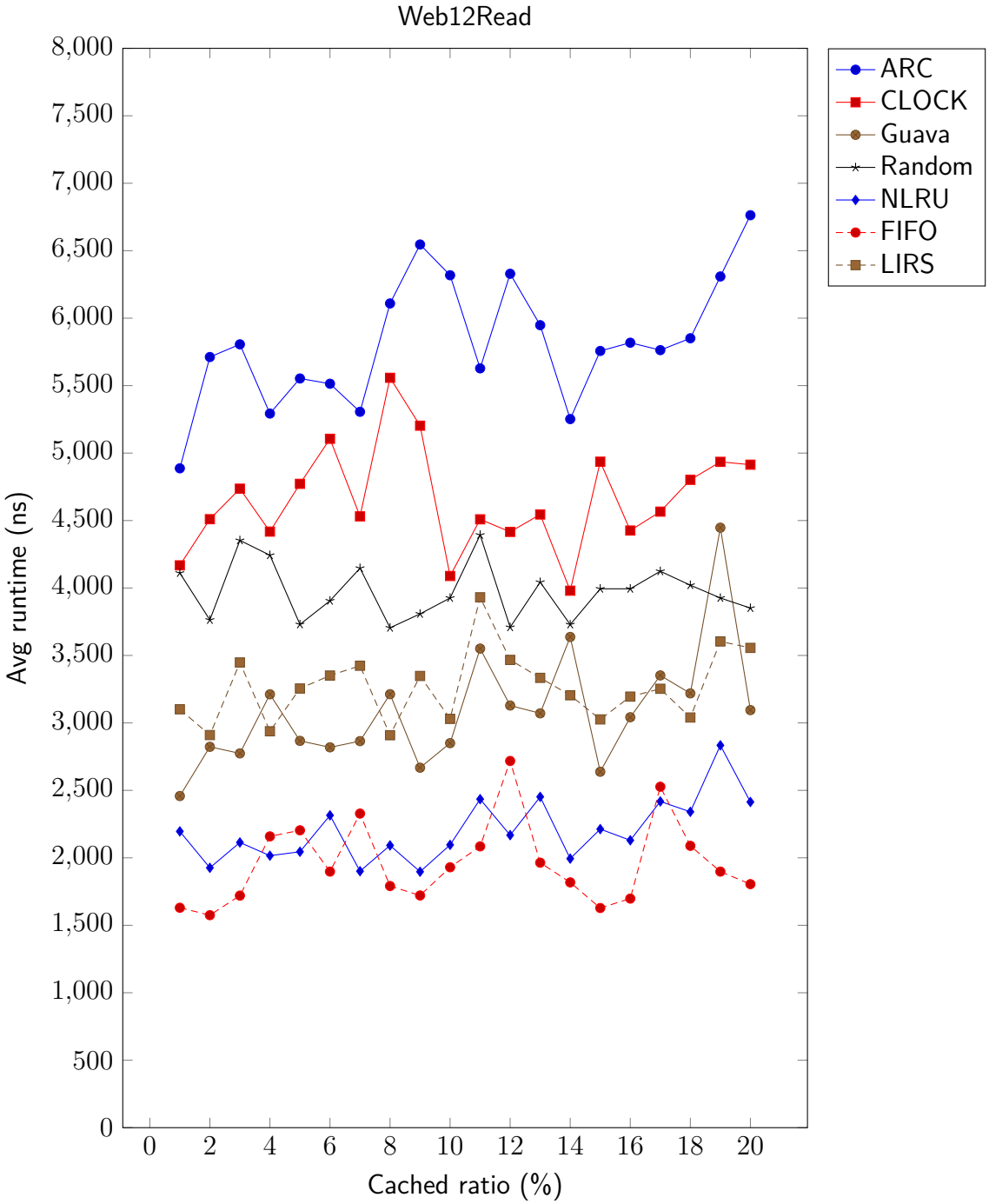

FifoCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

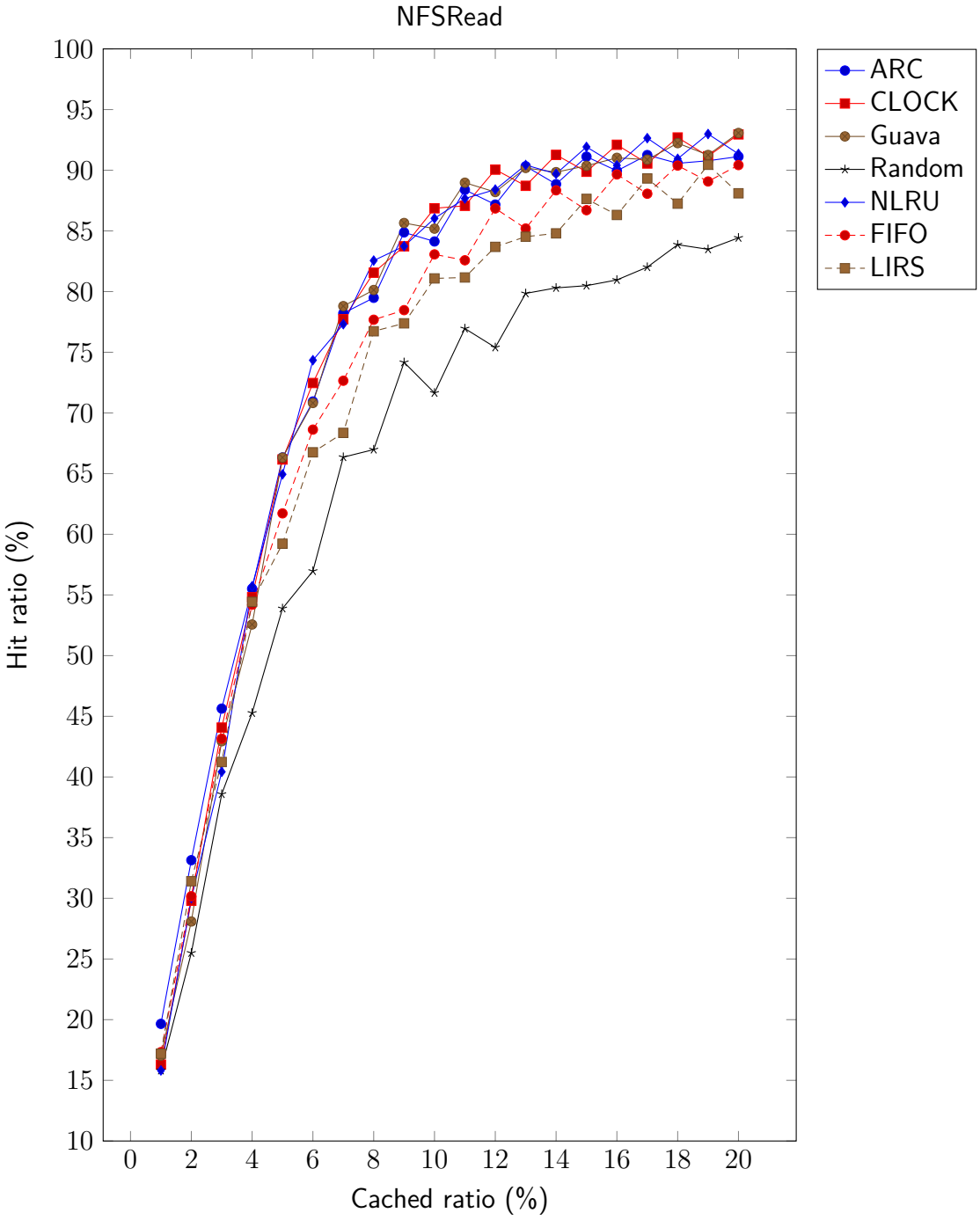

FifoCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

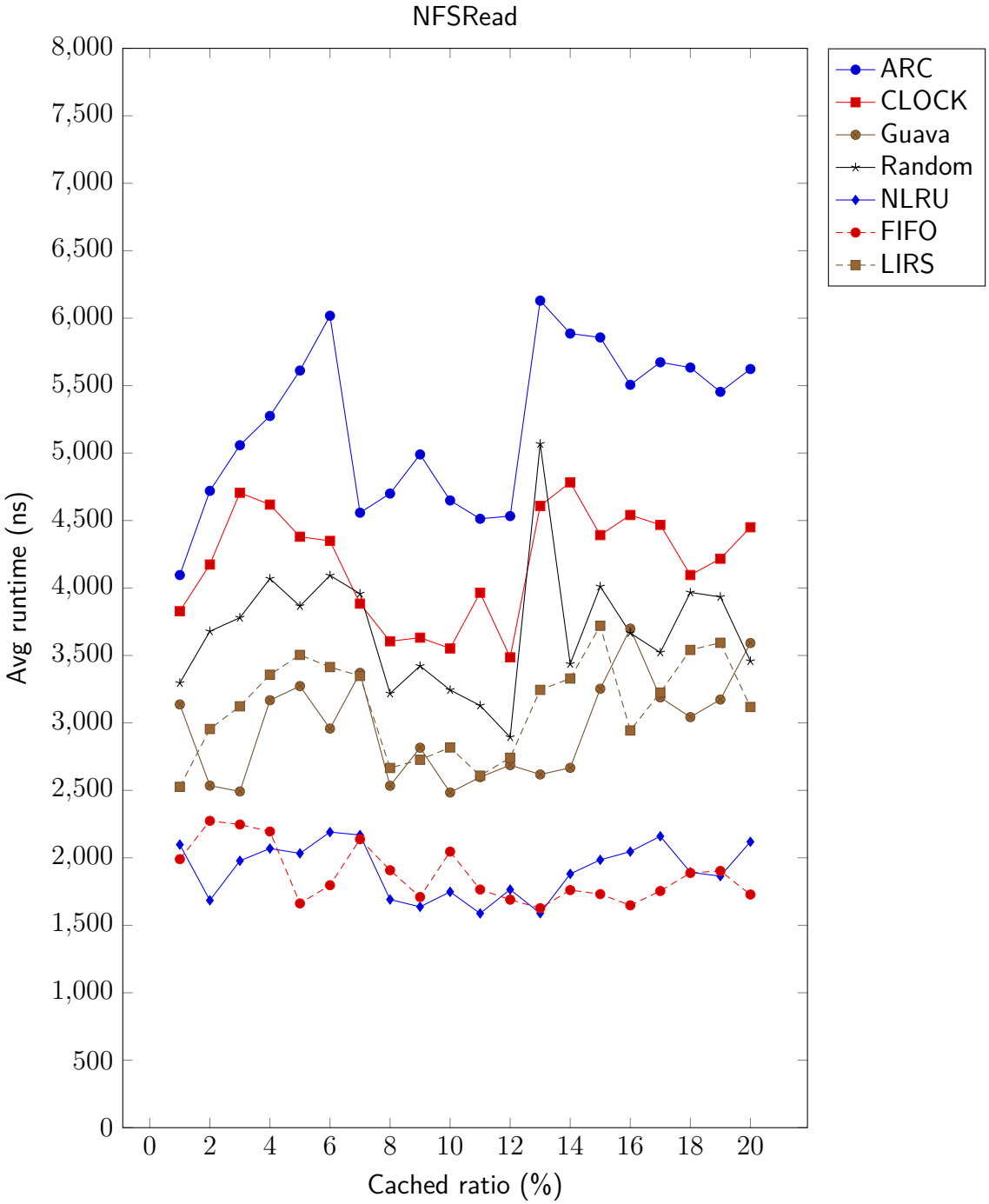

NativeLruCacheRead
Hit ratio (%)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
20
40
60
80
100
0
2
4
6
8
10
12
14
16
18
20

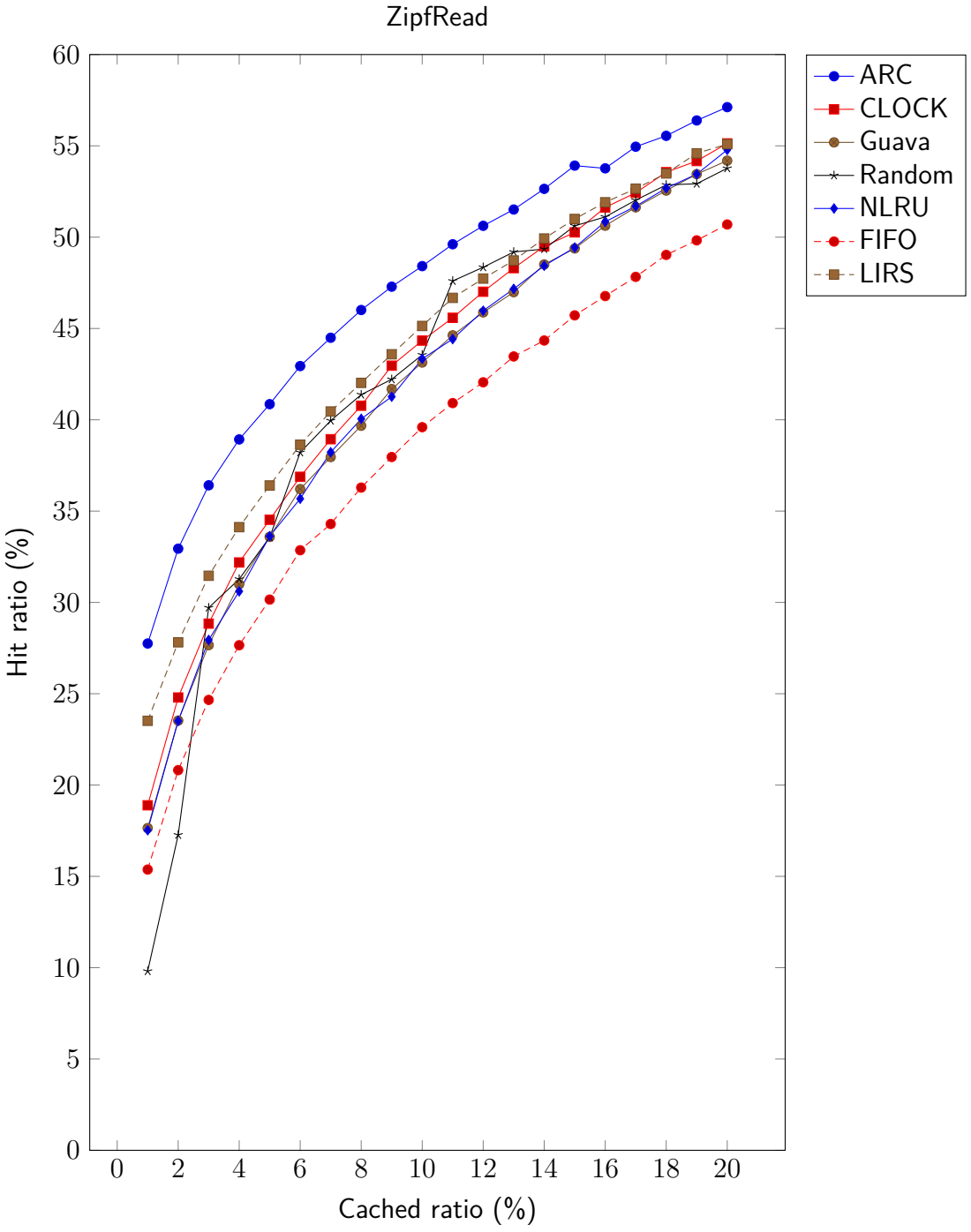

NativeLruCacheRead
Avg runtime (ns)
Cached ratio (%)
NFS
Web12
Zipf
Random
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
0
2
4
6
8
10
12
14
16
18
20

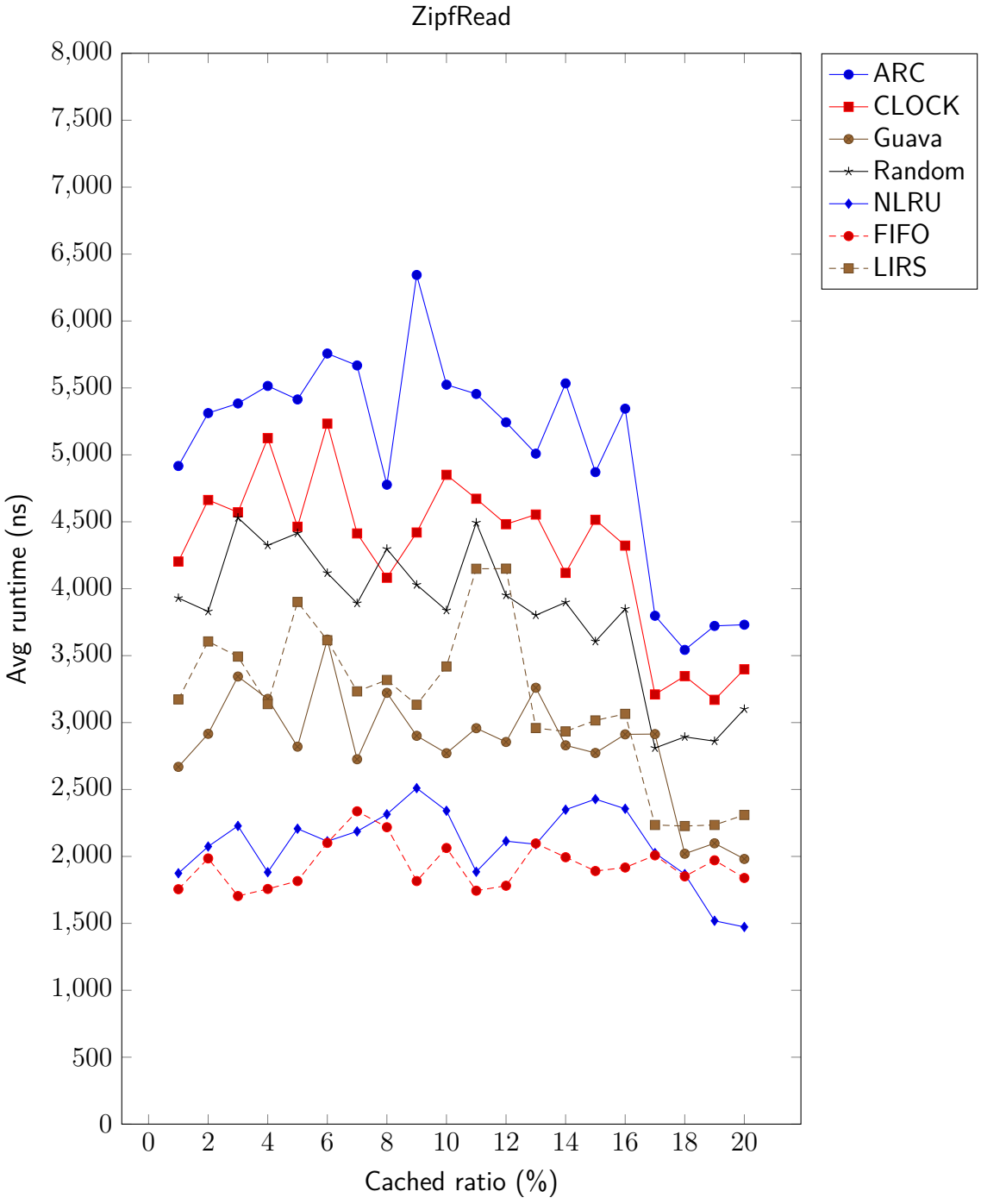

Web12Read
Hit ratio (%)
Cached ratio (%)
80
75
70
65
60
55
50
45
40
35
30
25
20
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS

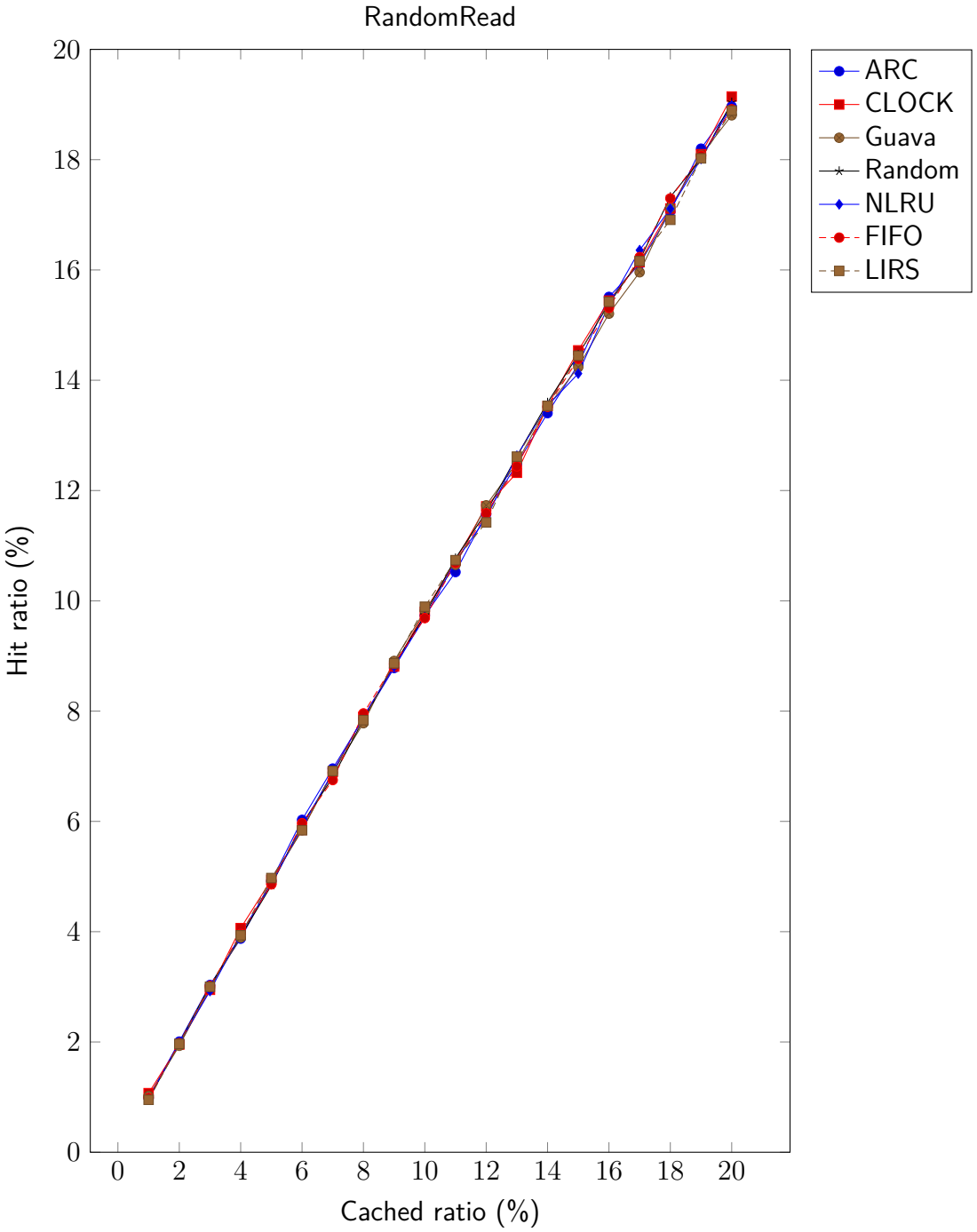

Web12Read
Avg runtime (ns)
Cached ratio (%)
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS

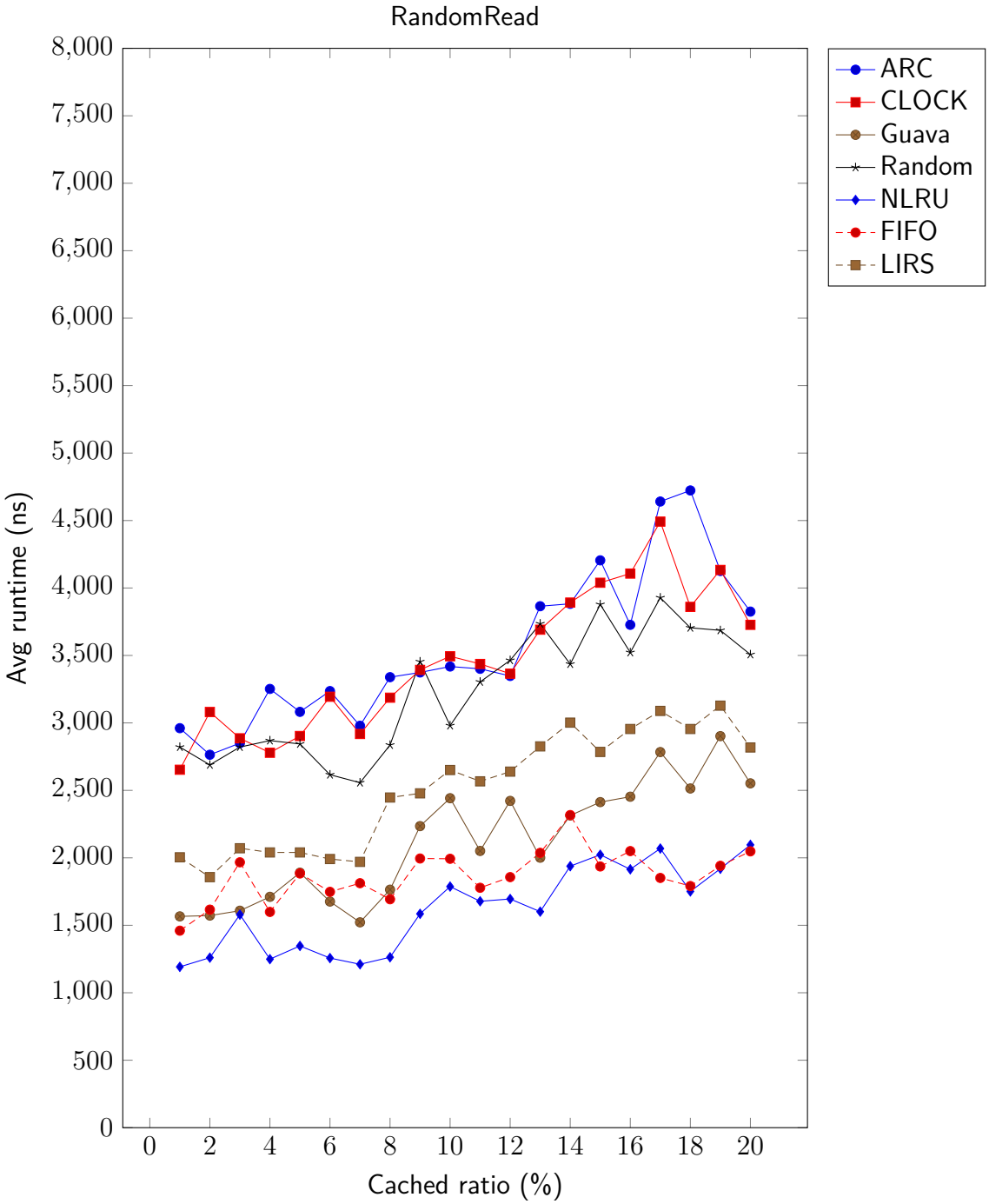

NFSRead
Hit ratio (%)
Cached ratio (%)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS


NFSRead
Avg runtime (ns)
Cached ratio (%)
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS


ZipfRead
Hit ratio (%)
Cached ratio (%)
0
5
10
15
20
25
30
35
40
45
50
55
60
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS


ZipfRead
Avg runtime (ns)
Cached ratio (%)
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS


RandomRead
Hit ratio (%)
Cached ratio (%)
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS


RandomRead
Avg runtime (ns)
Cached ratio (%)
0
500
1,000
1,500
2,000
2,500
3,000
3,500
4,000
4,500
5,000
5,500
6,000
6,500
7,000
7,500
8,000
0
2
4
6
8
10
12
14
16
18
20
ARC
CLOCK
Guava
Random
NLRU
FIFO
LIRS