FogBus Testing Results

Number of tasks (in 5 min)

	With Blockchain			Without Blockchain		
Max Load	94	88	267	653	135	1693
0.2 instr/sec	51	49	50	52	43	60

Energy per second - Power (watts)

	With Blockchain			Without Blockchain		
Max Load	22.5	136	21	29.5	148	28
0.2 instr/sec	21.5	134	20	23.5	135	22

Energy per task (joules)

	With Blockchain			Without Blockchain		
Max Load	71.80851	463.6364	23.59551	13.55283	328.8889	4.961607
0.2 instr/sec	126.4706	820.4082	120	135.5769	941.8605	110

Data packets sent / second

	With Blockchain			Without Blockchain		
Max Load	892	7214	142	1857	1482	1126
0.2 instr/sec	412	3241	146	483	2165	141

Data packets received / second

	With Blockchain			Without Blockchain		
Max Load	3949	45968	524	2858	4792	3219
0.2 instr/sec	504	29824	513	519	1133	506

Network Usage per task

	With Blockchain			Without Blockchain		
Max Load	51.5	604.3409	2.494382	7.220521	46.47407	2.56645
0.2 instr/sec	17.96078	674.7959	13.18	19.26923	76.69767	10.78333

Latency (seconds)

Remarks

Obtained from in script measurements

Obtained through Joulemeter application

Power X 5 minutes / Number of tasks

Obtained from Windows performance monitor

Obtained from Windows performance monitor

Data packets (sent + recd) / Number of tasks

Legend

Fog Only

Cloud Only

Master Only

	With Blockchain			Without Blockchain		
Max Load	3.178858	3.486904	1.166281	0.460067	2.240126	0.17726
0.2 instr/sec	3.043652	3.210355	1.188388	0.583891	2.368366	0.158922

Obtained from in script measurements

Master CPU Usage (%)

	With Blockchain			Without Blockchain		
Max Load	9.08	28.12	28.32	10.55	27.18	28.5
0.2 instr/sec	8.46	28.43	13.67	8.78	18.67	22.96

Obtained from Windows performance monitor

Master RAM Usage (%)

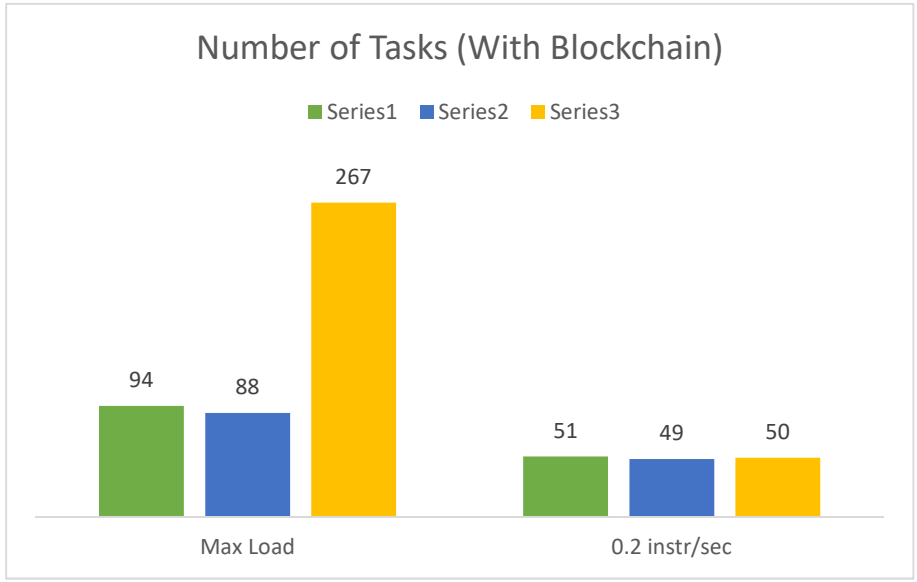
	With Blockchain			Without Blockchain		
Max Load	49.03	65.159	46.26	48.218	60.16	53.258
0.2 instr/sec	49.175	66.017	48.19	47.509	59.86	46.64

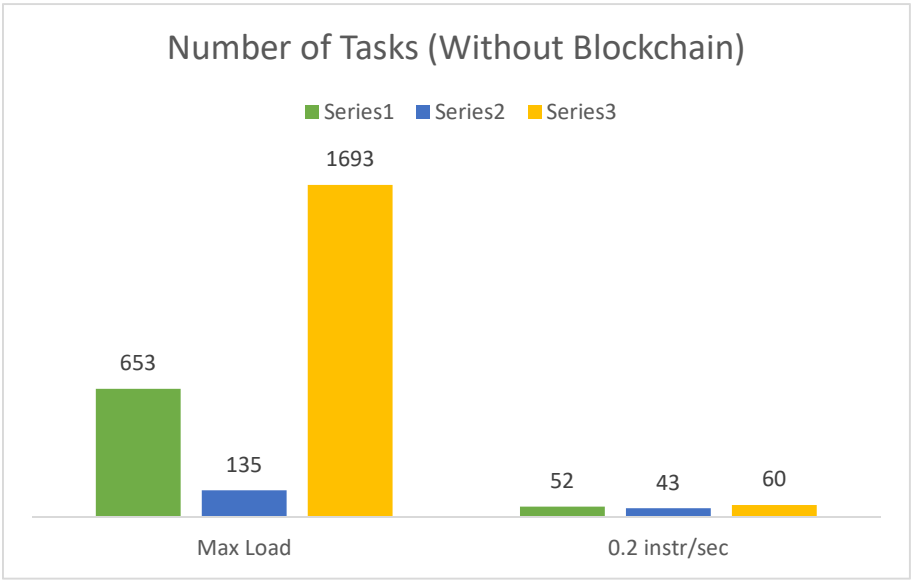
Obtained from Windows performance monitor

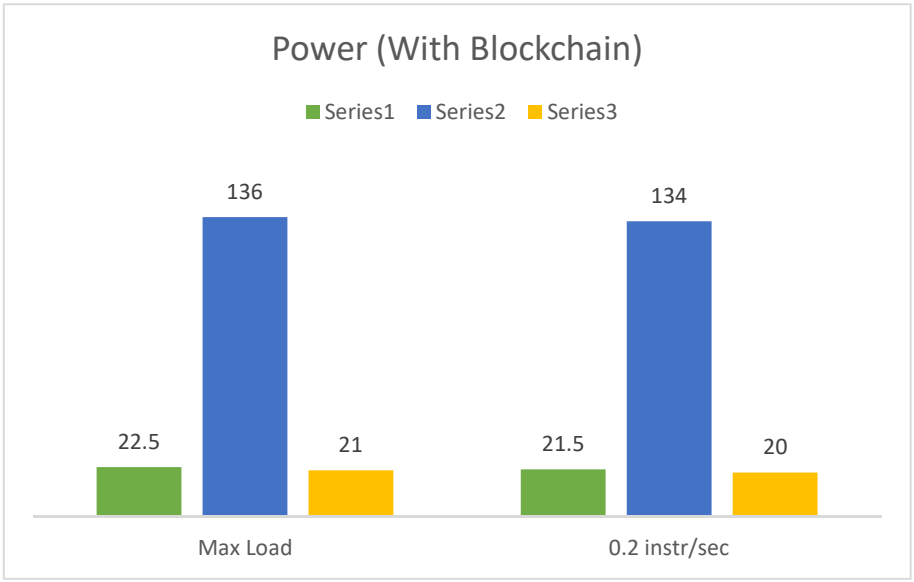
Master Cache Usage (E08 bytes)

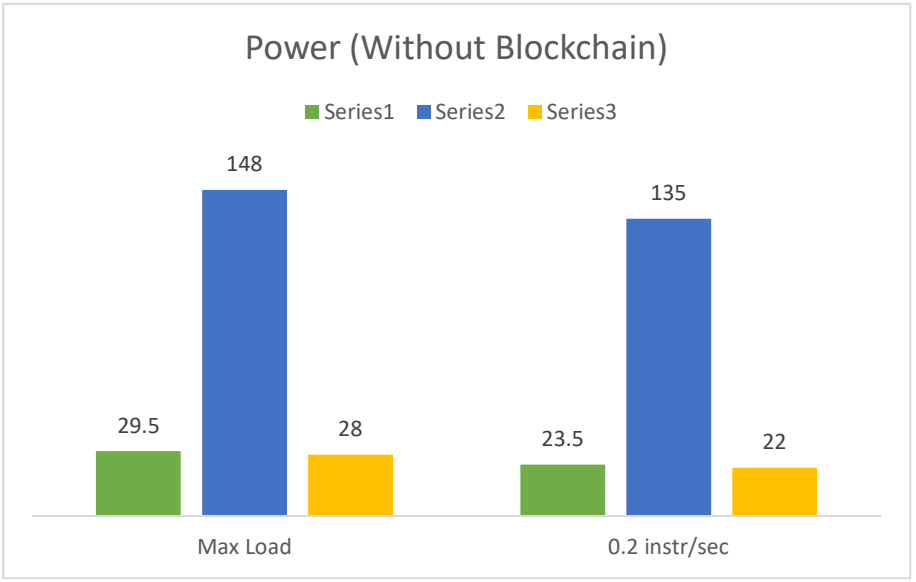
	With Blockchain			Without Blockchain		
Max Load	1.43	2.02	2.52	1.42	2.08	2.15
0.2 instr/sec	1.43	1.98	1.98	1.43	2.04	1.98

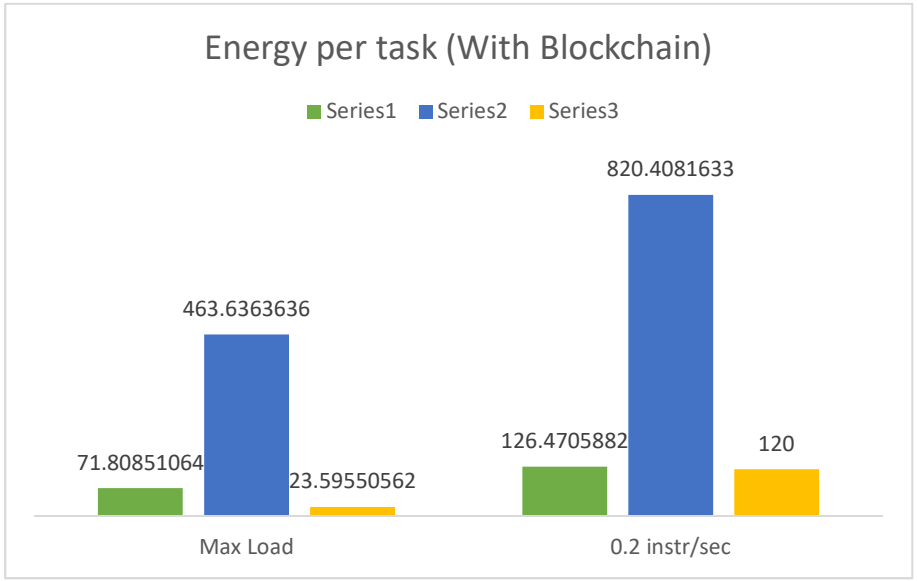
Obtained from Windows performance monitor

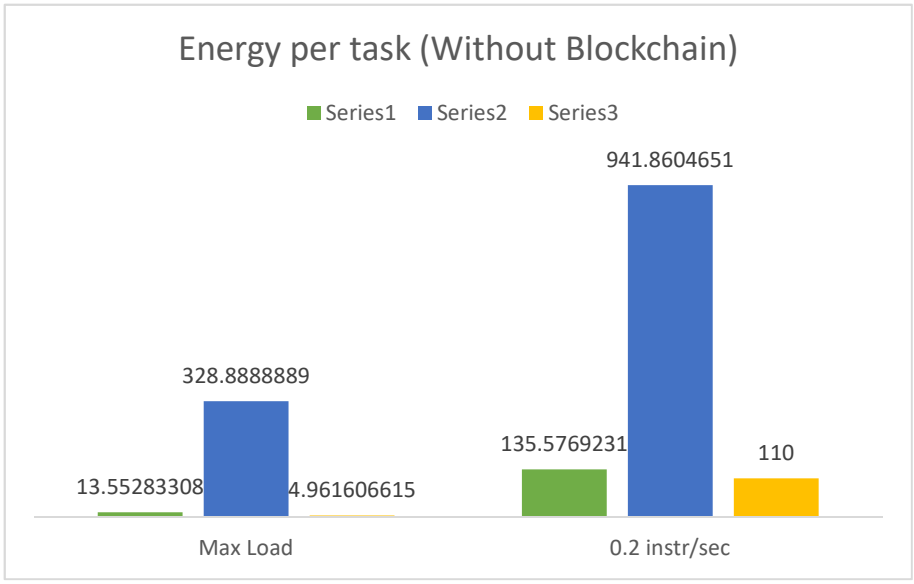

Number of Tasks (With Blockchain)
Series1
Series2
Series3
94
88
267
51
49
50
Max Load
0.2 instr/sec

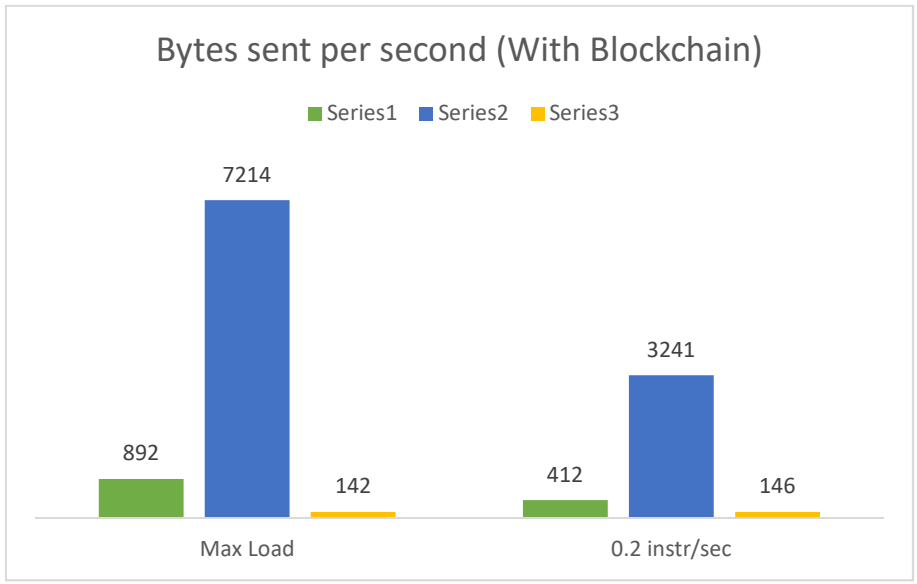

Number of Tasks (Without Blockchain)
Series1
Series2
Series3
653
135
1693
52
43
60
Max Load
0.2 instr/sec

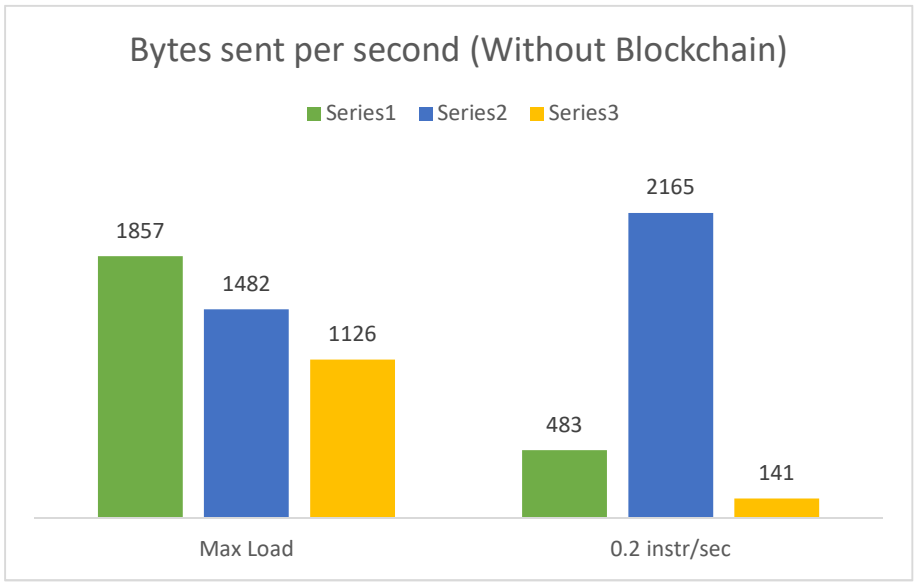

Power (With Blockchain)
Series1
Series2
Series3
22.5
136
21
21.5
134
20
Max Load
0.2 instr/sec

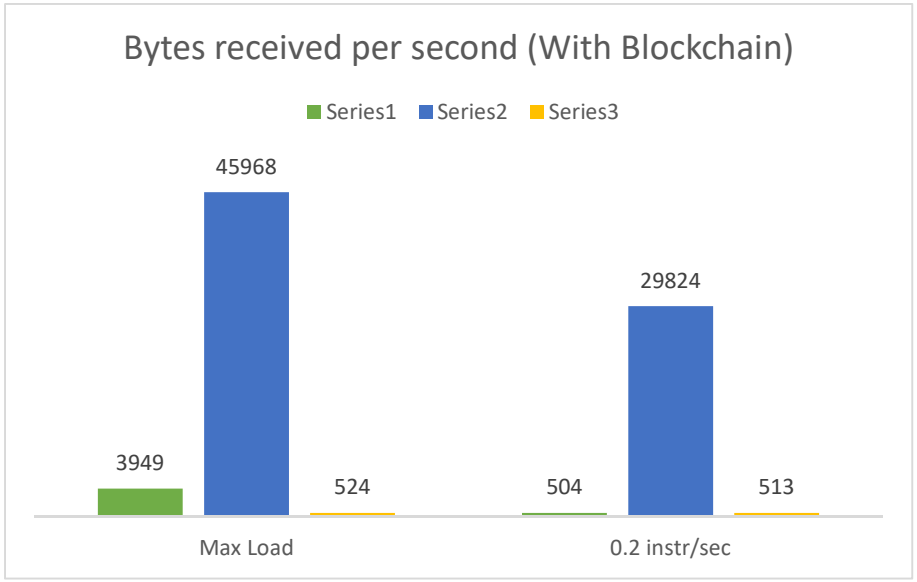

Power (Without Blockchain)
Series1
Series2
Series3
29.5
148
28
23.5
135
22
Max Load
0.2 instr/sec

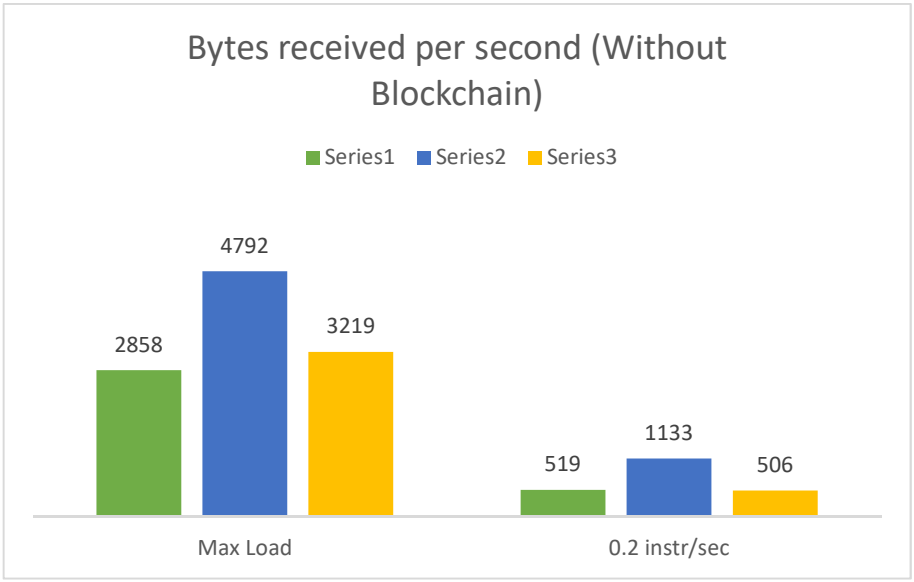

Energy per task (With Blockchain)
Series1
Series2
Series3
71.80851064
463.6363636
23.59550562
126.4705882
820.4081633
120
Max Load
0.2 instr/sec

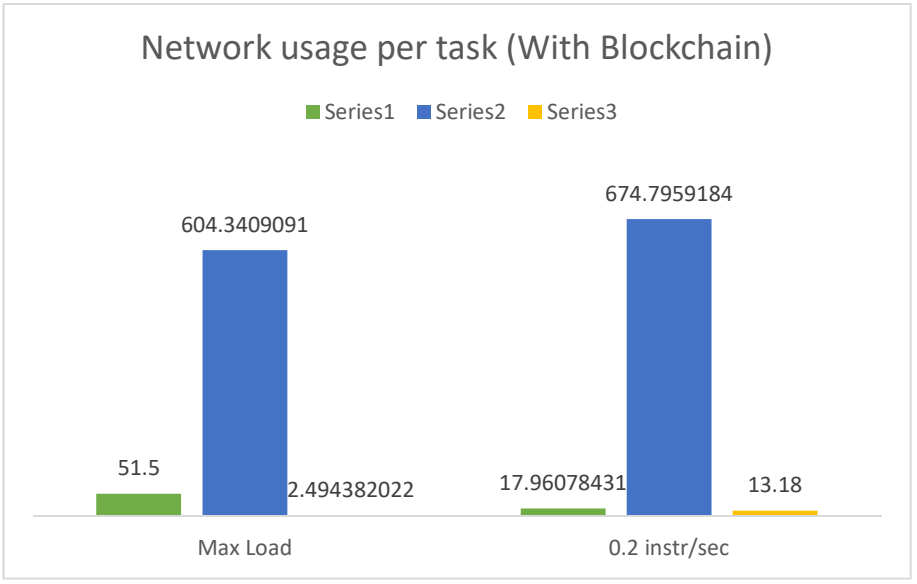

Energy per task (Without Blockchain)
Series1
Series2
Series3
13.55283308
328.8888889
4.961606615
135.5769231
941.8604651
110
Max Load
0.2 instr/sec

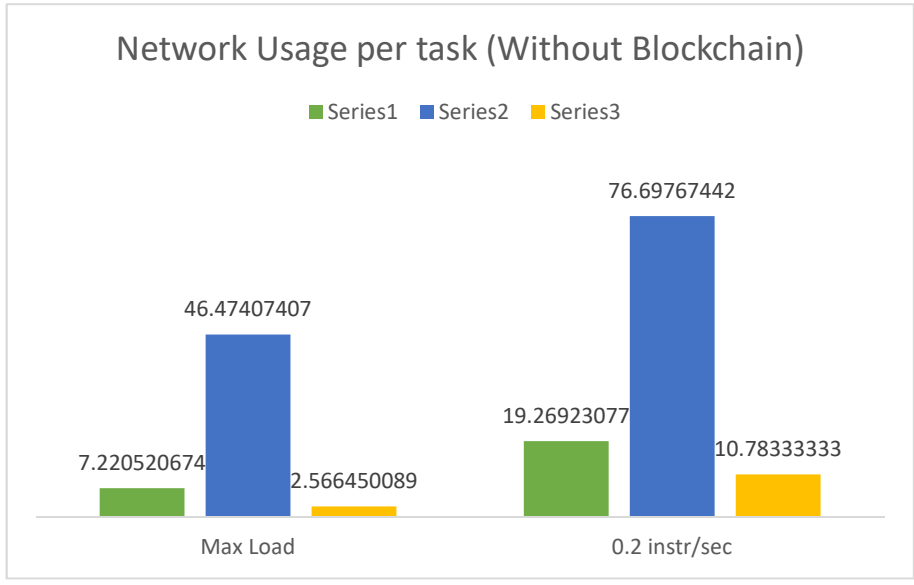

Bytes sent per second (With Blockchain)
Series1
Series2
Series3
892
7214
142
412
3241
146
Max Load
0.2 instr/sec

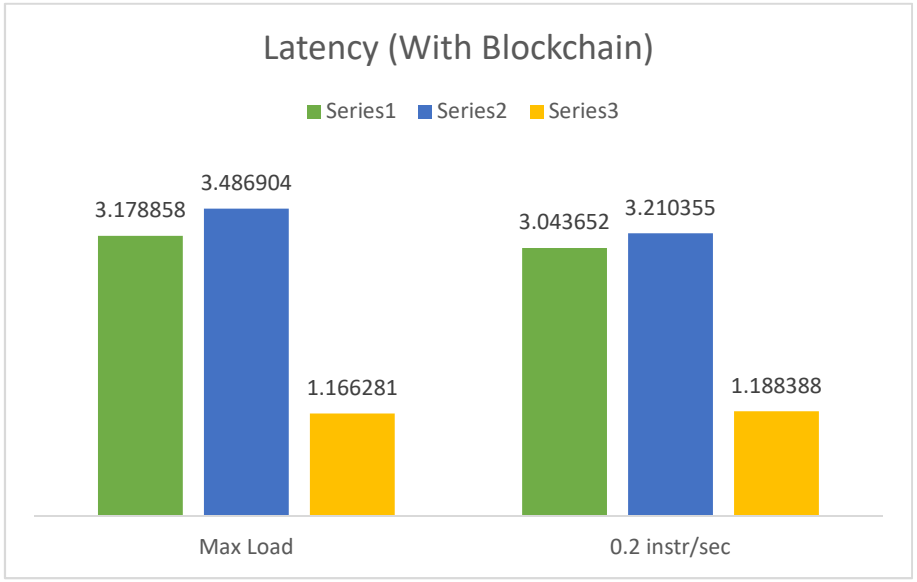

Bytes sent per second (Without Blockchain)
Series1
Series2
Series3
1857
1482
1126
483
2165
141
Max Load
0.2 instr/sec

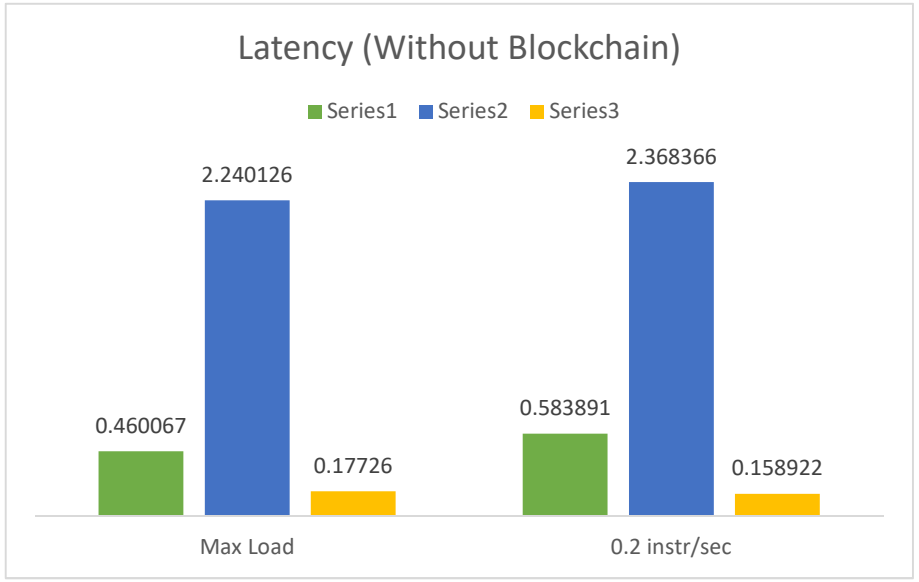

Bytes received per second (With Blockchain)
Series1
Series2
Series3
45968
3949
524
29824
504
513
Max Load
0.2 instr/sec

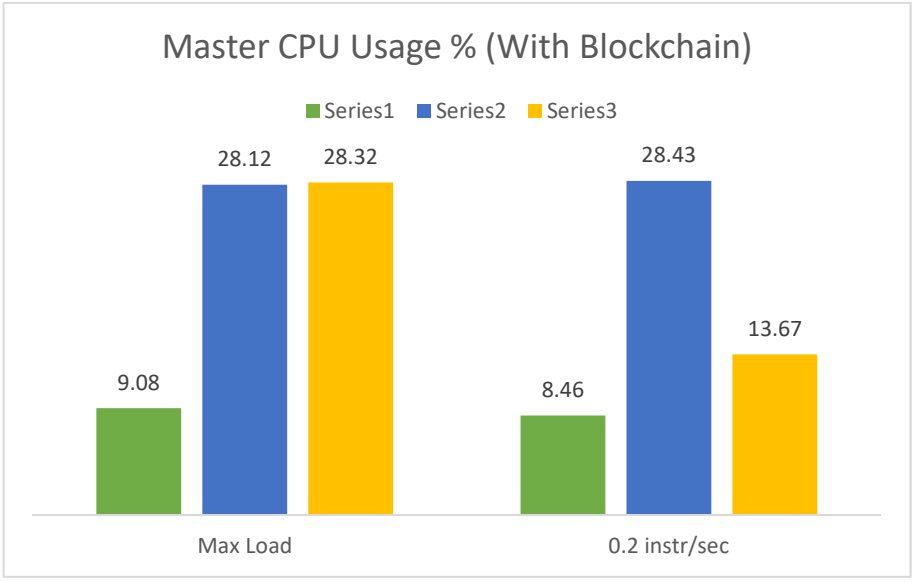

Bytes received per second (Without Blockchain)
Series1
Series2
Series3
4792
2858
3219
1133
519
506
Max Load
0.2 instr/sec

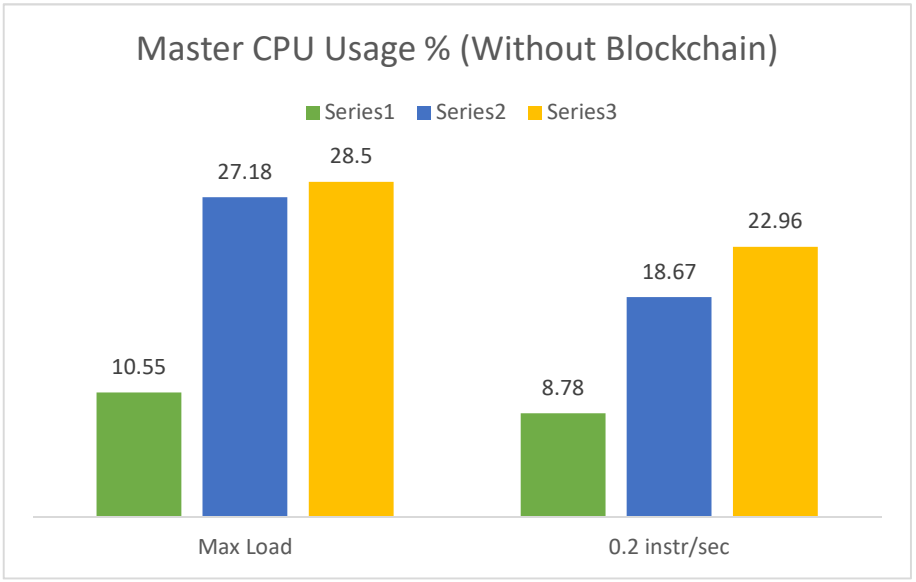

Network usage per task (With Blockchain)
Series1
Series2
Series3
604.3409091
674.7959184
51.5
2.494382022
17.96078431
13.18
Max Load
0.2 instr/sec

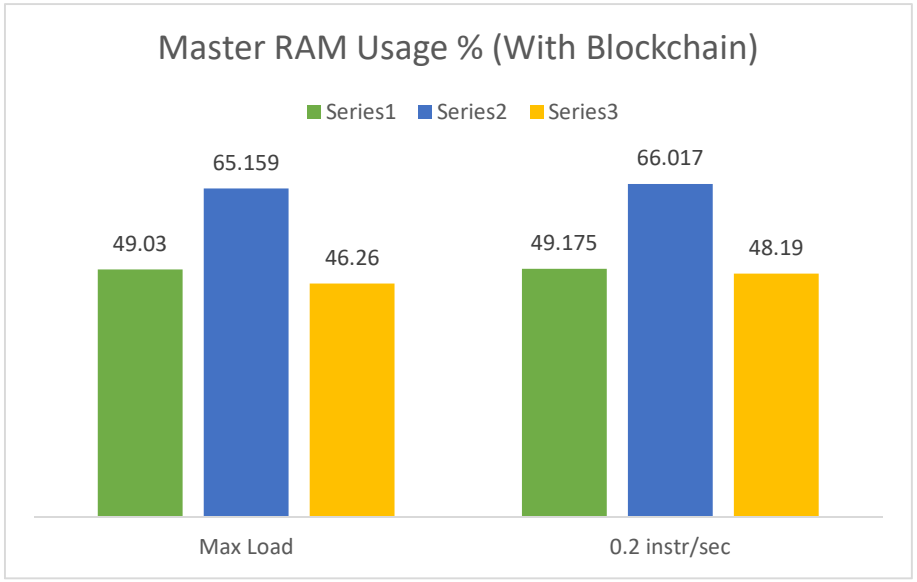

Network Usage per task (Without Blockchain)
Series1
Series2
Series3
76.69767442
46.47407407
19.26923077
7.220520674
2.566450089
10.78333333
Max Load
0.2 instr/sec

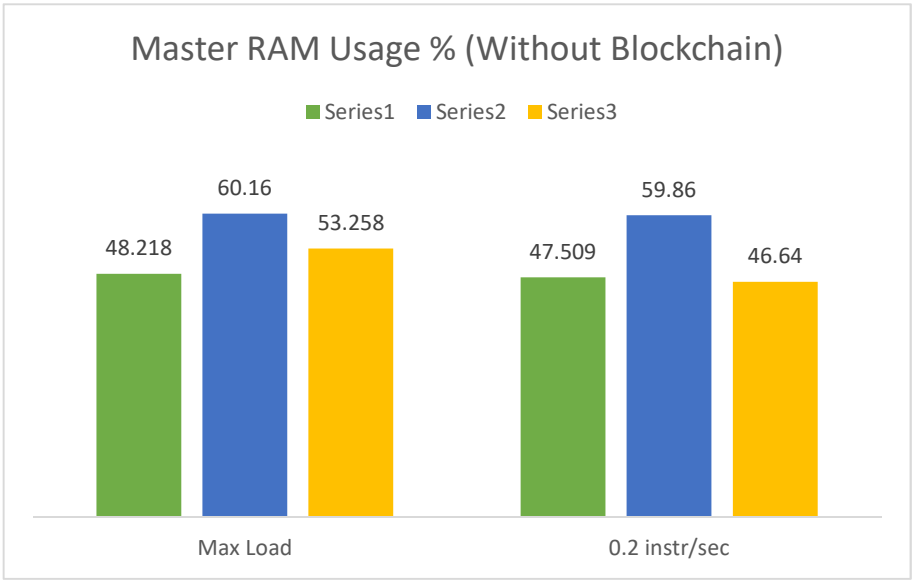

Latency (With Blockchain)
Series1
Series2
Series3
3.178858
3.486904
1.166281
3.043652
3.210355
1.188388
Max Load
0.2 instr/sec

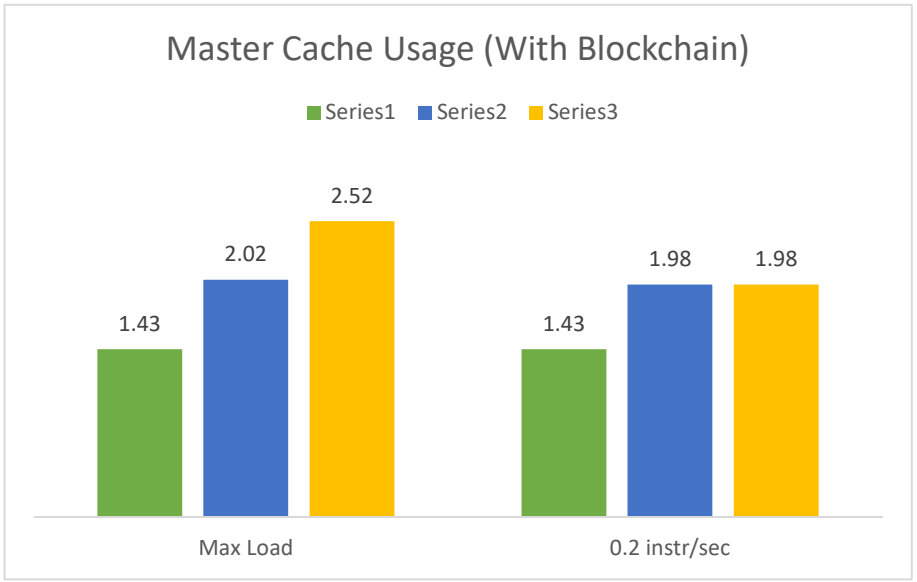

Latency (Without Blockchain)
Series1
Series2
Series3
0.460067
2.240126
0.17726
0.583891
2.368366
0.158922
Max Load
0.2 instr/sec

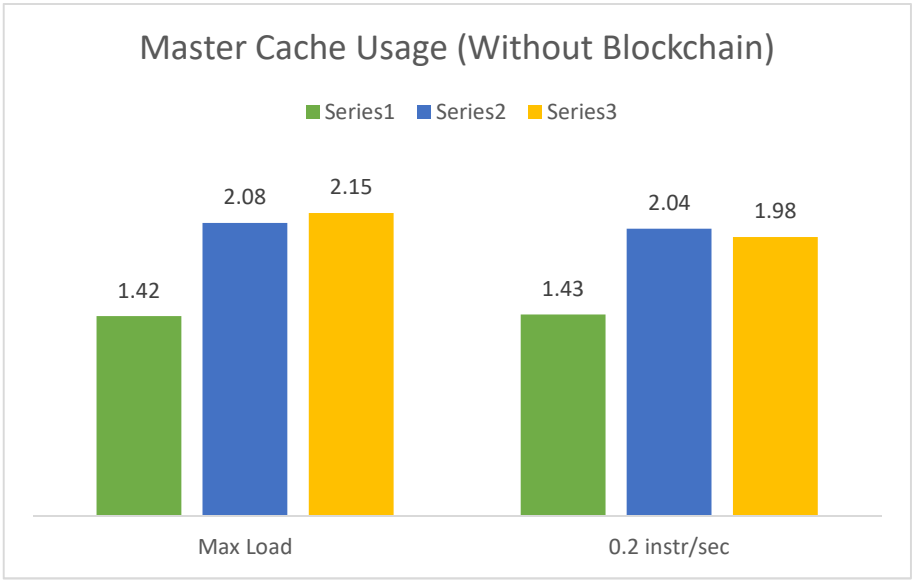

Master CPU Usage % (With Blockchain)
Series1
Series2
Series3
9.08
28.12
28.32
8.46
28.43
13.67
Max Load
0.2 instr/sec


Master CPU Usage % (Without Blockchain)
Series1
Series2
Series3
10.55
27.18
28.5
8.78
18.67
22.96
Max Load
0.2 instr/sec


Master RAM Usage % (With Blockchain)
Series1
Series2
Series3
49.03
65.159
46.26
49.175
66.017
48.19
Max Load
0.2 instr/sec


Master RAM Usage % (Without Blockchain)
Series1
Series2
Series3
48.218
60.16
53.258
47.509
59.86
46.64
Max Load
0.2 instr/sec


Master Cache Usage (With Blockchain)
Series1
Series2
Series3
1.43
2.02
2.52
1.43
1.98
1.98
Max Load
0.2 instr/sec


Master Cache Usage (Without Blockchain)
Series1
Series2
Series3
1.42
2.08
2.15
1.43
2.04
1.98
Max Load
0.2 instr/sec