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Machine Problem 4:

Results:

```
:: ./client -n 10000 -b 500 -w 20
n = 10000 w = 20 b = 500
CLIENT STARTED:
Establishing control channel... done.
Joe request threads complete
John request threads complete
Jane request threads complete
Deallocating worker threads
                    HISTOGRAM
Value   |       Joe       |    John    |  Jane
*****************************************************
0       |       112       |    83      |    98
1       |       112       |    79      |    105
2       |       101       |    97      |    102
3       |       101       |    105     |    129
4       |       109       |    95      |    119
5       |       98        |    110     |    85
6       |       117       |    110     |    113
7       |       97        |    94      |    93
8       |       117       |    102     |    101
9       |       110       |    106     |    102
10      |       90        |    90      |    99
11      |       81        |    99      |    107
12      |       117       |    98      |    86
13      |       84        |    101     |    113
14      |       94        |    99      |    88
15      |       104       |    101     |    90
16      |       103       |    107     |    105
17      |       100       |    89      |    92
18      |       102       |    108     |    113
19      |       87        |    95      |    101
20      |       106       |    81      |    97
21      |       114       |    103     |    102
22      |       105       |    111     |    104
23      |       105       |    112     |    95
24      |       100       |    116     |    92
25      |       98        |    97      |    103
26      |       104       |    108     |    99
27      |       108       |    105     |    101
28      |       107       |    123     |    109
29      |       98        |    87      |    88
30      |       97        |    96      |    78
31      |       92        |    105     |    97
```

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```
21  |       114   |   103   |   102
22  |       105   |   111   |   104
23  |       105   |   112   |   95
24  |       100   |   116   |   92
25  |       98    |   97    |   103
26  |       104   |   108   |   99
27  |       108   |   105   |   101
28  |       107   |   123   |   109
29  |       98    |   87    |   88
30  |       97    |   96    |   78
31  |       92    |   105   |   97
32  |       94    |   101   |   109
33  |       87    |   87    |   100
34  |       107   |   94    |   102
35  |       110   |   117   |   87
36  |       86    |   126   |   97
37  |       92    |   102   |   78
38  |       113   |   97    |   87
39  |       98    |   111   |   102
40  |       95    |   94    |   87
41  |       81    |   83    |   90
42  |       90    |   86    |   116
43  |       95    |   99    |   108
44  |       106   |   90    |   103
45  |       95    |   105   |   86
46  |       78    |   99    |   80
47  |       90    |   97    |   113
48  |       98    |   97    |   97
49  |       106   |   102   |   100
50  |       106   |   92    |   109
51  |       97    |   98    |   98
52  |       67    |   99    |   84
53  |       73    |   88    |   102
54  |       101   |   113   |   103
55  |       99    |   98    |   91
56  |       92    |   124   |   104
57  |       113   |   93    |   98
58  |       98    |   88    |   109
59  |       116   |   107   |   89
60  |       108   |   101   |   95
61  |       103   |   99    |   115
62  |       123   |   81    |   94
63  |       90    |   101   |   115
```

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```
64    |      87      |     100      |    100
65    |      90      |      94      |     91
66    |     103      |      84      |     92
67    |      95      |     109      |     92
68    |     102      |      88      |     99
69    |     107      |      94      |     99
70    |      97      |     110      |    106
71    |      99      |     110      |    101
72    |      96      |      96      |     96
73    |      88      |     113      |     92
74    |     120      |     101      |    105
75    |      98      |      96      |    100
76    |     122      |     105      |     99
77    |     111      |     101      |     91
78    |     114      |      97      |    104
79    |      86      |      80      |    103
80    |     107      |      91      |    101
81    |      98      |     108      |     87
82    |     100      |     111      |     97
83    |      99      |      95      |    105
84    |     110      |     105      |    105
85    |      96      |     101      |     99
86    |     112      |      93      |     90
87    |     100      |      95      |    102
88    |      90      |      89      |     91
89    |     104      |     101      |    123
90    |      95      |     121      |    118
91    |     118      |     100      |    111
92    |     117      |     106      |     93
93    |      87      |      98      |    111
94    |     112      |     117      |     99
95    |      94      |      92      |    106
96    |      87      |     110      |    124
97    |      96      |     107      |    108
98    |      93      |     101      |    103
99    |      93      |     100      |    103
Total requests: 30000
Number of worker threads: 20
Size of bounded buffer: 500
Total time: 6 seconds and 252663 micro seconds
close requests channel control
```

Sample Runs:

-n is 10000 for all values in the chart:

-b	-w	Runtime
500	20	9.512460
500	21	7.233590
500	22	9.305809
500	25	9.135809

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500	28	5.695180
500	30	4.806573

-b	-w	Runtime
100	30	5.191650
200	30	3.757037
300	30	7.724483
400	30	5.510610
450	30	4.198210
500	30	6.698093