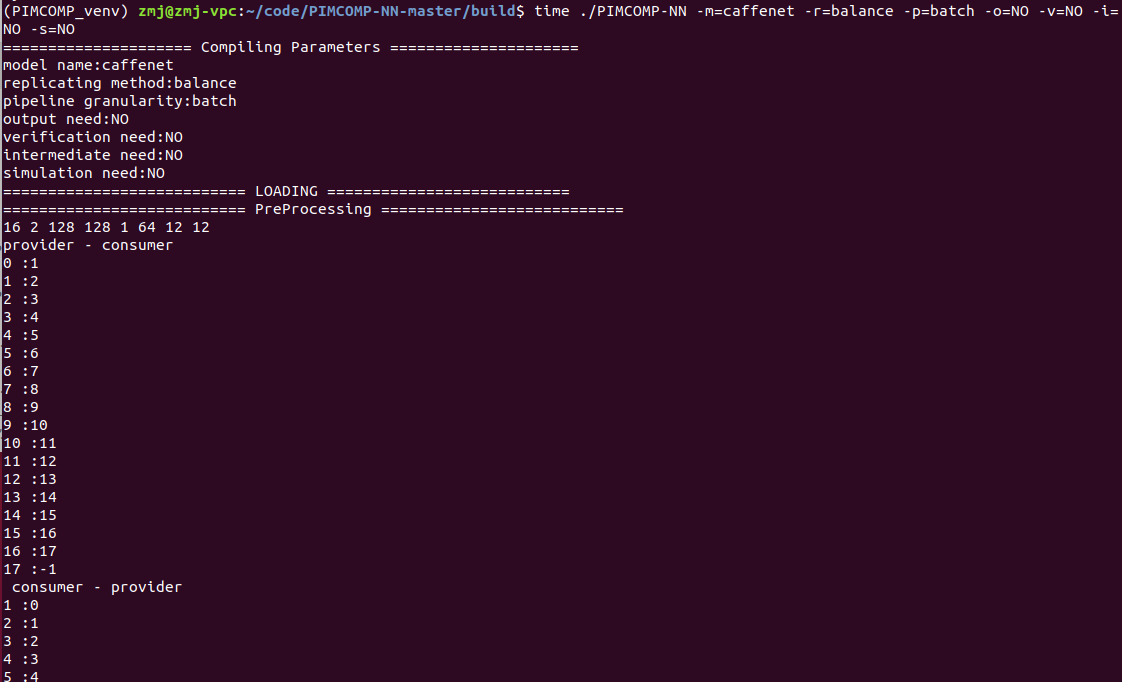
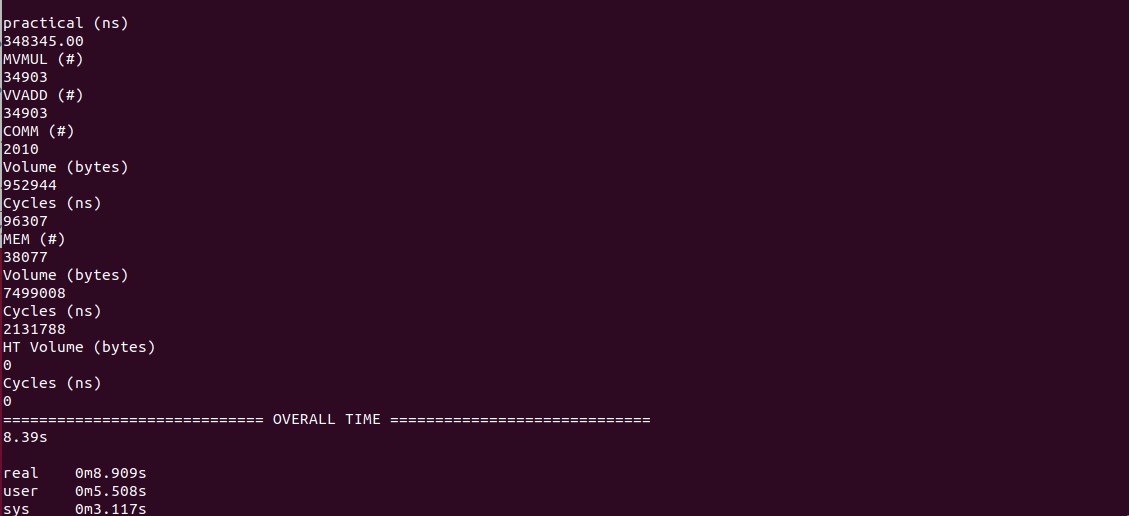
# 前端

（项目里已有该模型的json文件，所以不需运行前端来生成json文件）

# 后端

## LL





(PIMCOMP\_venv) zmj@zmj-vpc:~/code/PIMCOMP-NN-master/build$ time ./PIMCOMP-NN -m=caffenet -r=balance -p=batch -o=NO -v=NO -i=NO -s=NO

===================== Compiling Parameters =====================

model name:caffenet

replicating method:balance

pipeline granularity:batch

output need:NO

verification need:NO

intermediate need:NO

simulation need:NO

=========================== LOADING ===========================

=========================== PreProcessing ===========================

16 2 128 128 1 64 12 12

provider - consumer

0 :1

1 :2

2 :3

3 :4

4 :5

5 :6

6 :7

7 :8

8 :9

9 :10

10 :11

11 :12

12 :13

13 :14

14 :15

15 :16

16 :17

17 :-1

consumer - provider

1 :0

2 :1

3 :2

4 :3

5 :4

6 :5

7 :6

8 :7

9 :8

10 :9

11 :10

12 :11

13 :12

14 :13

15 :14

16 :15

17 :16

=========================== MODEL INFO ===========================

#Nodes in total: 18

1

input: 294kB

output: 546.75kB

Weight Matrix:363 × 96

min crossbar:1

4

input: 136.688kB

output: 364.5kB

Weight Matrix:2400 × 256

min crossbar:2

7

input: 84.5kB

output: 126.75kB

Weight Matrix:2304 × 384

min crossbar:3

8

input: 126.75kB

output: 126.75kB

Weight Matrix:3456 × 384

min crossbar:3

9

input: 126.75kB

output: 84.5kB

Weight Matrix:3456 × 256

min crossbar:2

12

output: 0.0078125MB

Weight Matrix:9216 × 4096

min crossbar:32

14

output: 0.0078125MB

Weight Matrix:4096 × 4096

min crossbar:32

16

output: 0.00190735MB

Weight Matrix:4096 × 1000

min crossbar:8

FC Weight: 111.812MB

Sum Weight: 118.957MB

FC Ratio: 93.994%

Output Sum:1.2375MB

Minimum Crossbar Num in One Core:32

=========================== REPLICATING ===========================

node:1 replication\_num:119

node:4 replication\_num:31

node:7 replication\_num:8

node:8 replication\_num:8

node:9 replication\_num:8

node:12 replication\_num:1

node:14 replication\_num:1

node:16 replication\_num:1

=========================== PARTITIONING ===========================

#RRAMs needed: 6631

#ArrayGroups needed: 1658

RRAMs Usage: 71.951%

Replication Check Pass!

============================= MAPPING =============================

0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64

split AG num: 0

Mapping Check Pass!

========================= BATCH PIPELINE SCHEDULING =========================

------------- INSTRUCTION GENERATION -------------

effective\_instruction\_group\_num:25

------------- MEMORY ALLOCATION -------------

------------- DATA RELOAD -------------

Reload Input Stage

Store Output Stage

=========================== OPTIMIZATION ===========================

============================= PLACING =============================

============================= EVALUATING =============================

instruction\_group\_num:25

0 MVMUL:1572 MEM:1921 LATENCY: 348309.0 COMM\_SYN:0.04% COMM\_TRANS:0.09% MVMUL:329400.00 MVMUL:94.57% VEC:0.21% MEM:15875.00 MEM:4.56% ratio:99.46% COMM Volume:4.50kB MEM Volume:273.94kB

1 MVMUL:1569 MEM:2059 LATENCY: 347714.0 COMM\_SYN:0.07% COMM\_TRANS:2.69% MVMUL:328800.00 MVMUL:94.56% VEC:0.21% MEM:6756.00 MEM:1.94% ratio:99.47% COMM Volume:9.00kB MEM Volume:289.62kB

2 MVMUL:1569 MEM:1987 LATENCY: 347747.0 COMM\_SYN:0.03% COMM\_TRANS:2.60% MVMUL:328800.00 MVMUL:94.55% VEC:0.00% MEM:7869.00 MEM:2.26% ratio:99.45% COMM Volume:4.50kB MEM Volume:280.62kB

3 MVMUL:1572 MEM:1931 LATENCY: 348345.0 COMM\_SYN:0.03% COMM\_TRANS:0.08% MVMUL:329400.00 MVMUL:94.56% VEC:0.21% MEM:15945.00 MEM:4.58% ratio:99.46% COMM Volume:4.50kB MEM Volume:275.19kB

4 MVMUL:1569 MEM:2056 LATENCY: 347780.0 COMM\_SYN:0.00% COMM\_TRANS:0.14% MVMUL:328800.00 MVMUL:94.54% VEC:0.21% MEM:15946.00 MEM:4.59% ratio:99.47% COMM Volume:9.00kB MEM Volume:289.25kB

5 MVMUL:1209 MEM:1404 LATENCY: 342898.0 COMM\_SYN:19.40% COMM\_TRANS:0.20% MVMUL:256800.00 MVMUL:74.89% VEC:0.56% MEM:12676.00 MEM:3.70% ratio:98.74% COMM Volume:16.50kB MEM Volume:216.19kB

6 MVMUL:768 MEM:747 LATENCY: 339924.0 COMM\_SYN:45.40% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.42% VEC:0.56% MEM:10885.00 MEM:3.20% ratio:98.87% COMM Volume:24.00kB MEM Volume:174.50kB

7 MVMUL:768 MEM:901 LATENCY: 339944.0 COMM\_SYN:44.81% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.42% VEC:0.56% MEM:12894.00 MEM:3.79% ratio:98.87% COMM Volume:24.00kB MEM Volume:208.62kB

8 MVMUL:768 MEM:887 LATENCY: 339956.0 COMM\_SYN:43.72% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.42% VEC:0.56% MEM:16615.00 MEM:4.89% ratio:98.87% COMM Volume:24.00kB MEM Volume:195.62kB

9 MVMUL:768 MEM:893 LATENCY: 339984.0 COMM\_SYN:43.07% COMM\_TRANS:0.28% MVMUL:168433.00 MVMUL:49.54% VEC:0.56% MEM:18392.00 MEM:5.41% ratio:98.86% COMM Volume:24.00kB MEM Volume:200.81kB

10 MVMUL:768 MEM:892 LATENCY: 340004.0 COMM\_SYN:42.31% COMM\_TRANS:0.28% MVMUL:168600.00 MVMUL:49.59% VEC:0.56% MEM:20842.00 MEM:6.13% ratio:98.87% COMM Volume:24.00kB MEM Volume:212.06kB

11 MVMUL:768 MEM:887 LATENCY: 340016.0 COMM\_SYN:41.66% COMM\_TRANS:0.28% MVMUL:168010.00 MVMUL:49.41% VEC:0.56% MEM:23624.00 MEM:6.95% ratio:98.87% COMM Volume:24.00kB MEM Volume:195.62kB

12 MVMUL:768 MEM:895 LATENCY: 340044.0 COMM\_SYN:40.14% COMM\_TRANS:0.28% MVMUL:168751.00 MVMUL:49.63% VEC:0.56% MEM:28061.00 MEM:8.25% ratio:98.87% COMM Volume:24.00kB MEM Volume:198.75kB

13 MVMUL:768 MEM:882 LATENCY: 340064.0 COMM\_SYN:39.17% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.40% VEC:0.56% MEM:32132.00 MEM:9.45% ratio:98.87% COMM Volume:24.00kB MEM Volume:206.44kB

14 MVMUL:768 MEM:876 LATENCY: 340076.0 COMM\_SYN:38.53% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.40% VEC:0.56% MEM:34189.00 MEM:10.05% ratio:98.83% COMM Volume:24.00kB MEM Volume:193.31kB

15 MVMUL:768 MEM:907 LATENCY: 340104.0 COMM\_SYN:37.89% COMM\_TRANS:0.28% MVMUL:168042.00 MVMUL:49.41% VEC:0.56% MEM:36469.00 MEM:10.72% ratio:98.87% COMM Volume:24.00kB MEM Volume:201.69kB

16 MVMUL:768 MEM:908 LATENCY: 340124.0 COMM\_SYN:37.10% COMM\_TRANS:0.28% MVMUL:168600.00 MVMUL:49.57% VEC:0.56% MEM:38622.00 MEM:11.36% ratio:98.87% COMM Volume:24.00kB MEM Volume:208.81kB

17 MVMUL:768 MEM:862 LATENCY: 340136.0 COMM\_SYN:36.33% COMM\_TRANS:0.28% MVMUL:168600.00 MVMUL:49.57% VEC:0.56% MEM:41239.00 MEM:12.12% ratio:98.87% COMM Volume:24.00kB MEM Volume:193.50kB

18 MVMUL:768 MEM:897 LATENCY: 340164.0 COMM\_SYN:35.41% COMM\_TRANS:0.28% MVMUL:168026.00 MVMUL:49.40% VEC:0.56% MEM:44958.00 MEM:13.22% ratio:98.87% COMM Volume:24.00kB MEM Volume:199.31kB

19 MVMUL:768 MEM:902 LATENCY: 340184.0 COMM\_SYN:34.44% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.39% VEC:0.56% MEM:48271.00 MEM:14.19% ratio:98.86% COMM Volume:24.00kB MEM Volume:207.38kB

20 MVMUL:768 MEM:858 LATENCY: 340196.0 COMM\_SYN:34.30% COMM\_TRANS:0.28% MVMUL:168375.00 MVMUL:49.49% VEC:0.56% MEM:48423.00 MEM:14.23% ratio:98.87% COMM Volume:24.00kB MEM Volume:193.19kB

21 MVMUL:768 MEM:915 LATENCY: 340224.0 COMM\_SYN:32.84% COMM\_TRANS:0.28% MVMUL:169200.00 MVMUL:49.73% VEC:0.56% MEM:52563.00 MEM:15.45% ratio:98.87% COMM Volume:24.00kB MEM Volume:200.75kB

22 MVMUL:768 MEM:763 LATENCY: 340244.0 COMM\_SYN:31.89% COMM\_TRANS:0.28% MVMUL:168000.00 MVMUL:49.38% VEC:0.56% MEM:57010.00 MEM:16.76% ratio:98.87% COMM Volume:24.00kB MEM Volume:176.19kB

23 MVMUL:483 MEM:348 LATENCY: 340068.0 COMM\_SYN:47.78% COMM\_TRANS:0.14% MVMUL:111600.00 MVMUL:32.82% VEC:0.00% MEM:62850.00 MEM:18.48% ratio:99.22% COMM Volume:12.00kB MEM Volume:74.81kB

24 MVMUL:459 MEM:380 LATENCY: 154564.0 COMM\_SYN:3.10% COMM\_TRANS:1.70% MVMUL:106200.00 MVMUL:68.71% VEC:1.63% MEM:32834.00 MEM:21.24% ratio:96.38% COMM Volume:15.75kB MEM Volume:117.00kB

25 MVMUL:447 MEM:414 LATENCY: 158961.0 COMM\_SYN:2.73% COMM\_TRANS:2.50% MVMUL:102600.00 MVMUL:64.54% VEC:1.66% MEM:40056.00 MEM:25.20% ratio:96.64% COMM Volume:32.25kB MEM Volume:115.00kB

26 MVMUL:462 MEM:463 LATENCY: 159261.0 COMM\_SYN:1.77% COMM\_TRANS:1.77% MVMUL:105600.00 MVMUL:66.31% VEC:1.66% MEM:40093.00 MEM:25.17% ratio:96.68% COMM Volume:33.00kB MEM Volume:127.25kB

27 MVMUL:462 MEM:461 LATENCY: 159247.0 COMM\_SYN:2.04% COMM\_TRANS:1.63% MVMUL:105600.00 MVMUL:66.31% VEC:1.66% MEM:39881.00 MEM:25.04% ratio:96.68% COMM Volume:33.00kB MEM Volume:126.75kB

28 MVMUL:462 MEM:457 LATENCY: 159235.0 COMM\_SYN:2.38% COMM\_TRANS:1.61% MVMUL:105600.00 MVMUL:66.32% VEC:1.66% MEM:39343.00 MEM:24.71% ratio:96.67% COMM Volume:33.00kB MEM Volume:125.75kB

29 MVMUL:462 MEM:469 LATENCY: 159219.0 COMM\_SYN:1.18% COMM\_TRANS:0.90% MVMUL:105872.00 MVMUL:66.49% VEC:0.00% MEM:44759.00 MEM:28.11% ratio:96.68% COMM Volume:16.50kB MEM Volume:128.75kB

30 MVMUL:354 MEM:260 LATENCY: 158973.0 COMM\_SYN:17.00% COMM\_TRANS:2.33% MVMUL:84000.00 MVMUL:52.84% VEC:3.32% MEM:33671.00 MEM:21.18% ratio:96.67% COMM Volume:33.00kB MEM Volume:85.00kB

31 MVMUL:462 MEM:370 LATENCY: 155162.0 COMM\_SYN:8.83% COMM\_TRANS:1.47% MVMUL:108741.00 MVMUL:70.08% VEC:0.00% MEM:27200.00 MEM:17.53% ratio:97.91% COMM Volume:16.50kB MEM Volume:93.00kB

32 MVMUL:462 MEM:458 LATENCY: 159203.0 COMM\_SYN:5.51% COMM\_TRANS:1.31% MVMUL:105754.00 MVMUL:66.43% VEC:1.66% MEM:34663.00 MEM:21.77% ratio:96.68% COMM Volume:33.00kB MEM Volume:126.00kB

33 MVMUL:462 MEM:455 LATENCY: 159191.0 COMM\_SYN:2.26% COMM\_TRANS:1.49% MVMUL:106200.00 MVMUL:66.71% VEC:1.66% MEM:38959.00 MEM:24.47% ratio:96.60% COMM Volume:33.00kB MEM Volume:125.25kB

34 MVMUL:462 MEM:464 LATENCY: 159175.0 COMM\_SYN:1.04% COMM\_TRANS:1.53% MVMUL:105600.00 MVMUL:66.34% VEC:1.66% MEM:41575.00 MEM:26.12% ratio:96.68% COMM Volume:33.00kB MEM Volume:127.50kB

35 MVMUL:462 MEM:448 LATENCY: 155955.0 COMM\_SYN:2.50% COMM\_TRANS:0.46% MVMUL:106152.00 MVMUL:68.07% VEC:0.00% MEM:42541.00 MEM:27.28% ratio:98.30% COMM Volume:16.50kB MEM Volume:112.50kB

36 MVMUL:462 MEM:455 LATENCY: 158989.0 COMM\_SYN:12.66% COMM\_TRANS:0.94% MVMUL:105600.00 MVMUL:66.42% VEC:1.66% MEM:23828.00 MEM:14.99% ratio:96.67% COMM Volume:16.50kB MEM Volume:125.25kB

37 MVMUL:462 MEM:461 LATENCY: 159163.0 COMM\_SYN:7.51% COMM\_TRANS:1.76% MVMUL:105600.00 MVMUL:66.35% VEC:1.66% MEM:30892.00 MEM:19.41% ratio:96.68% COMM Volume:33.00kB MEM Volume:126.75kB

38 MVMUL:462 MEM:461 LATENCY: 159145.0 COMM\_SYN:8.63% COMM\_TRANS:1.62% MVMUL:105600.00 MVMUL:66.35% VEC:1.66% MEM:29304.00 MEM:18.41% ratio:96.67% COMM Volume:33.00kB MEM Volume:126.75kB

39 MVMUL:441 MEM:442 LATENCY: 156750.0 COMM\_SYN:16.30% COMM\_TRANS:1.48% MVMUL:101400.00 MVMUL:64.69% VEC:2.30% MEM:19438.00 MEM:12.40% ratio:97.16% COMM Volume:39.00kB MEM Volume:118.50kB

40 MVMUL:315 MEM:223 LATENCY: 116284.0 COMM\_SYN:13.18% COMM\_TRANS:0.39% MVMUL:72000.00 MVMUL:61.92% VEC:0.00% MEM:26710.00 MEM:22.97% ratio:98.45% COMM Volume:11.25kB MEM Volume:56.25kB

41 MVMUL:639 MEM:483 LATENCY: 165161.0 COMM\_SYN:0.75% COMM\_TRANS:0.37% MVMUL:141600.00 MVMUL:85.73% VEC:0.00% MEM:17981.00 MEM:10.89% ratio:97.74% COMM Volume:11.25kB MEM Volume:127.00kB

42 MVMUL:699 MEM:604 LATENCY: 178964.0 COMM\_SYN:3.39% COMM\_TRANS:0.82% MVMUL:153000.00 MVMUL:85.49% VEC:0.94% MEM:13210.00 MEM:7.38% ratio:98.02% COMM Volume:10.50kB MEM Volume:162.00kB

43 MVMUL:682 MEM:646 LATENCY: 180574.0 COMM\_SYN:7.04% COMM\_TRANS:1.06% MVMUL:149677.00 MVMUL:82.89% VEC:0.97% MEM:10992.00 MEM:6.09% ratio:98.05% COMM Volume:21.50kB MEM Volume:167.25kB

44 MVMUL:704 MEM:693 LATENCY: 180742.0 COMM\_SYN:3.21% COMM\_TRANS:0.49% MVMUL:154000.00 MVMUL:85.20% VEC:0.97% MEM:14753.00 MEM:8.16% ratio:98.04% COMM Volume:22.00kB MEM Volume:179.00kB

45 MVMUL:704 MEM:681 LATENCY: 180762.0 COMM\_SYN:1.22% COMM\_TRANS:0.49% MVMUL:154000.00 MVMUL:85.19% VEC:0.97% MEM:18373.00 MEM:10.16% ratio:98.04% COMM Volume:22.00kB MEM Volume:176.00kB

46 MVMUL:704 MEM:703 LATENCY: 180782.0 COMM\_SYN:0.16% COMM\_TRANS:0.70% MVMUL:154173.00 MVMUL:85.28% VEC:0.97% MEM:19743.00 MEM:10.92% ratio:98.04% COMM Volume:22.00kB MEM Volume:181.50kB

47 MVMUL:476 MEM:353 LATENCY: 180614.0 COMM\_SYN:25.95% COMM\_TRANS:0.46% MVMUL:108728.00 MVMUL:60.20% VEC:0.00% MEM:21127.00 MEM:11.70% ratio:98.31% COMM Volume:11.00kB MEM Volume:92.50kB

48 MVMUL:2 MEM:4 LATENCY: 65248.0 COMM\_SYN:0.21% COMM\_TRANS:17.17% MVMUL:1000.00 MVMUL:1.53% VEC:68.66% MEM:5552.00 MEM:8.51% ratio:96.08% COMM Volume:280.00kB MEM Volume:16.50kB

49 MVMUL:2 MEM:3 LATENCY: 8160.0 COMM\_SYN:0.00% COMM\_TRANS:3.92% MVMUL:1000.00 MVMUL:12.25% VEC:0.00% MEM:5560.00 MEM:68.14% ratio:84.31% COMM Volume:8.00kB MEM Volume:8.50kB

50 MVMUL:2 MEM:3 LATENCY: 9760.0 COMM\_SYN:15.00% COMM\_TRANS:3.28% MVMUL:1000.00 MVMUL:10.25% VEC:0.00% MEM:5696.00 MEM:58.36% ratio:86.89% COMM Volume:8.00kB MEM Volume:8.50kB

51 MVMUL:2 MEM:3 LATENCY: 11360.0 COMM\_SYN:25.77% COMM\_TRANS:2.82% MVMUL:1000.00 MVMUL:8.80% VEC:0.00% MEM:5832.00 MEM:51.34% ratio:88.73% COMM Volume:8.00kB MEM Volume:8.50kB

52 MVMUL:2 MEM:3 LATENCY: 12960.0 COMM\_SYN:33.89% COMM\_TRANS:2.47% MVMUL:1000.00 MVMUL:7.72% VEC:0.00% MEM:5968.00 MEM:46.05% ratio:90.12% COMM Volume:8.00kB MEM Volume:8.50kB

53 MVMUL:2 MEM:3 LATENCY: 14560.0 COMM\_SYN:40.22% COMM\_TRANS:2.20% MVMUL:1000.00 MVMUL:6.87% VEC:0.00% MEM:6104.00 MEM:41.92% ratio:91.21% COMM Volume:8.00kB MEM Volume:8.50kB

54 MVMUL:2 MEM:3 LATENCY: 16160.0 COMM\_SYN:45.30% COMM\_TRANS:1.98% MVMUL:1000.00 MVMUL:6.19% VEC:0.00% MEM:6240.00 MEM:38.61% ratio:92.08% COMM Volume:8.00kB MEM Volume:8.50kB

55 MVMUL:2 MEM:3 LATENCY: 17760.0 COMM\_SYN:49.46% COMM\_TRANS:1.80% MVMUL:1000.00 MVMUL:5.63% VEC:0.00% MEM:6376.00 MEM:35.90% ratio:92.79% COMM Volume:8.00kB MEM Volume:8.50kB

56 MVMUL:2 MEM:3 LATENCY: 19360.0 COMM\_SYN:52.93% COMM\_TRANS:1.65% MVMUL:1000.00 MVMUL:5.17% VEC:0.00% MEM:6512.00 MEM:33.64% ratio:93.39% COMM Volume:8.00kB MEM Volume:8.50kB

57 MVMUL:2 MEM:3 LATENCY: 20960.0 COMM\_SYN:55.88% COMM\_TRANS:1.53% MVMUL:1000.00 MVMUL:4.77% VEC:0.00% MEM:6648.00 MEM:31.72% ratio:93.89% COMM Volume:8.00kB MEM Volume:8.50kB

58 MVMUL:2 MEM:3 LATENCY: 22560.0 COMM\_SYN:58.40% COMM\_TRANS:1.42% MVMUL:1000.00 MVMUL:4.43% VEC:0.00% MEM:6784.00 MEM:30.07% ratio:94.33% COMM Volume:8.00kB MEM Volume:8.50kB

59 MVMUL:2 MEM:3 LATENCY: 24160.0 COMM\_SYN:60.60% COMM\_TRANS:1.32% MVMUL:1000.00 MVMUL:4.14% VEC:0.00% MEM:6920.00 MEM:28.64% ratio:94.70% COMM Volume:8.00kB MEM Volume:8.50kB

60 MVMUL:2 MEM:3 LATENCY: 25760.0 COMM\_SYN:62.52% COMM\_TRANS:1.24% MVMUL:1000.00 MVMUL:3.88% VEC:0.00% MEM:7056.00 MEM:27.39% ratio:95.03% COMM Volume:8.00kB MEM Volume:8.50kB

61 MVMUL:2 MEM:3 LATENCY: 27360.0 COMM\_SYN:64.21% COMM\_TRANS:1.17% MVMUL:1000.00 MVMUL:3.65% VEC:0.00% MEM:7192.00 MEM:26.29% ratio:95.32% COMM Volume:8.00kB MEM Volume:8.50kB

62 MVMUL:2 MEM:3 LATENCY: 28960.0 COMM\_SYN:65.72% COMM\_TRANS:1.10% MVMUL:1000.00 MVMUL:3.45% VEC:0.00% MEM:7328.00 MEM:25.30% ratio:95.58% COMM Volume:8.00kB MEM Volume:8.50kB

63 MVMUL:2 MEM:3 LATENCY: 30560.0 COMM\_SYN:67.07% COMM\_TRANS:1.05% MVMUL:1000.00 MVMUL:3.27% VEC:0.00% MEM:7464.00 MEM:24.42% ratio:95.81% COMM Volume:8.00kB MEM Volume:8.50kB

64 MVMUL:2 MEM:3 LATENCY: 32160.0 COMM\_SYN:68.28% COMM\_TRANS:1.00% MVMUL:1000.00 MVMUL:3.11% VEC:0.00% MEM:7600.00 MEM:23.63% ratio:96.02% COMM Volume:8.00kB MEM Volume:8.50kB

65 MVMUL:2 MEM:3 LATENCY: 33760.0 COMM\_SYN:69.38% COMM\_TRANS:0.95% MVMUL:1000.00 MVMUL:2.96% VEC:0.00% MEM:7736.00 MEM:22.91% ratio:96.21% COMM Volume:8.00kB MEM Volume:8.50kB

66 MVMUL:2 MEM:3 LATENCY: 35360.0 COMM\_SYN:70.38% COMM\_TRANS:0.90% MVMUL:1000.00 MVMUL:2.83% VEC:0.00% MEM:7872.00 MEM:22.26% ratio:96.38% COMM Volume:8.00kB MEM Volume:8.50kB

67 MVMUL:2 MEM:3 LATENCY: 36960.0 COMM\_SYN:71.23% COMM\_TRANS:0.87% MVMUL:1000.00 MVMUL:2.71% VEC:0.00% MEM:8032.00 MEM:21.73% ratio:96.54% COMM Volume:8.00kB MEM Volume:8.50kB

68 MVMUL:2 MEM:3 LATENCY: 38560.0 COMM\_SYN:72.07% COMM\_TRANS:0.83% MVMUL:1000.00 MVMUL:2.59% VEC:0.00% MEM:8168.00 MEM:21.18% ratio:96.68% COMM Volume:8.00kB MEM Volume:8.50kB

69 MVMUL:2 MEM:3 LATENCY: 40160.0 COMM\_SYN:72.85% COMM\_TRANS:0.80% MVMUL:1000.00 MVMUL:2.49% VEC:0.00% MEM:8304.00 MEM:20.68% ratio:96.81% COMM Volume:8.00kB MEM Volume:8.50kB

70 MVMUL:2 MEM:3 LATENCY: 41760.0 COMM\_SYN:73.56% COMM\_TRANS:0.77% MVMUL:1000.00 MVMUL:2.39% VEC:0.00% MEM:8440.00 MEM:20.21% ratio:96.93% COMM Volume:8.00kB MEM Volume:8.50kB

71 MVMUL:2 MEM:3 LATENCY: 43360.0 COMM\_SYN:74.23% COMM\_TRANS:0.74% MVMUL:1000.00 MVMUL:2.31% VEC:0.00% MEM:8576.00 MEM:19.78% ratio:97.05% COMM Volume:8.00kB MEM Volume:8.50kB

72 MVMUL:2 MEM:3 LATENCY: 44960.0 COMM\_SYN:74.84% COMM\_TRANS:0.71% MVMUL:1000.00 MVMUL:2.22% VEC:0.00% MEM:8712.00 MEM:19.38% ratio:97.15% COMM Volume:8.00kB MEM Volume:8.50kB

73 MVMUL:2 MEM:3 LATENCY: 46560.0 COMM\_SYN:75.36% COMM\_TRANS:0.69% MVMUL:1000.00 MVMUL:2.15% VEC:0.00% MEM:8872.00 MEM:19.05% ratio:97.25% COMM Volume:8.00kB MEM Volume:8.50kB

74 MVMUL:2 MEM:3 LATENCY: 48160.0 COMM\_SYN:75.90% COMM\_TRANS:0.66% MVMUL:1000.00 MVMUL:2.08% VEC:0.00% MEM:9008.00 MEM:18.70% ratio:97.34% COMM Volume:8.00kB MEM Volume:8.50kB

75 MVMUL:2 MEM:3 LATENCY: 49760.0 COMM\_SYN:76.40% COMM\_TRANS:0.64% MVMUL:1000.00 MVMUL:2.01% VEC:0.00% MEM:9144.00 MEM:18.38% ratio:97.43% COMM Volume:8.00kB MEM Volume:8.50kB

76 MVMUL:2 MEM:3 LATENCY: 51360.0 COMM\_SYN:76.85% COMM\_TRANS:0.62% MVMUL:1000.00 MVMUL:1.95% VEC:0.00% MEM:9292.00 MEM:18.09% ratio:97.51% COMM Volume:8.00kB MEM Volume:8.50kB

77 MVMUL:2 MEM:3 LATENCY: 52960.0 COMM\_SYN:77.29% COMM\_TRANS:0.60% MVMUL:1000.00 MVMUL:1.89% VEC:0.00% MEM:9428.00 MEM:17.80% ratio:97.58% COMM Volume:8.00kB MEM Volume:8.50kB

78 MVMUL:2 MEM:3 LATENCY: 54560.0 COMM\_SYN:77.71% COMM\_TRANS:0.59% MVMUL:1000.00 MVMUL:1.83% VEC:0.00% MEM:9564.00 MEM:17.53% ratio:97.65% COMM Volume:8.00kB MEM Volume:8.50kB

79 MVMUL:2 MEM:3 LATENCY: 56160.0 COMM\_SYN:78.10% COMM\_TRANS:0.57% MVMUL:1000.00 MVMUL:1.78% VEC:0.00% MEM:9700.00 MEM:17.27% ratio:97.72% COMM Volume:8.00kB MEM Volume:8.50kB

80 MVMUL:2 MEM:3 LATENCY: 57760.0 COMM\_SYN:78.47% COMM\_TRANS:0.55% MVMUL:1000.00 MVMUL:1.73% VEC:0.00% MEM:9836.00 MEM:17.03% ratio:97.78% COMM Volume:8.00kB MEM Volume:8.50kB

81 MVMUL:2 MEM:3 LATENCY: 59360.0 COMM\_SYN:78.82% COMM\_TRANS:0.54% MVMUL:1000.00 MVMUL:1.68% VEC:0.00% MEM:9972.00 MEM:16.80% ratio:97.84% COMM Volume:8.00kB MEM Volume:8.50kB

82 MVMUL:2 MEM:3 LATENCY: 60960.0 COMM\_SYN:79.15% COMM\_TRANS:0.52% MVMUL:1000.00 MVMUL:1.64% VEC:0.00% MEM:10108.00 MEM:16.58% ratio:97.90% COMM Volume:8.00kB MEM Volume:8.50kB

83 MVMUL:2 MEM:3 LATENCY: 62560.0 COMM\_SYN:79.47% COMM\_TRANS:0.51% MVMUL:1000.00 MVMUL:1.60% VEC:0.00% MEM:10244.00 MEM:16.37% ratio:97.95% COMM Volume:8.00kB MEM Volume:8.50kB

84 MVMUL:2 MEM:4 LATENCY: 38368.0 COMM\_SYN:0.35% COMM\_TRANS:12.94% MVMUL:1000.00 MVMUL:2.61% VEC:50.04% MEM:10508.00 MEM:27.39% ratio:93.33% COMM Volume:120.00kB MEM Volume:16.50kB

85 MVMUL:2 MEM:3 LATENCY: 13280.0 COMM\_SYN:0.00% COMM\_TRANS:3.64% MVMUL:1000.00 MVMUL:7.53% VEC:0.00% MEM:10516.00 MEM:79.19% ratio:90.36% COMM Volume:8.00kB MEM Volume:8.50kB

86 MVMUL:2 MEM:3 LATENCY: 14880.0 COMM\_SYN:10.94% COMM\_TRANS:2.15% MVMUL:1000.00 MVMUL:6.72% VEC:0.00% MEM:10652.00 MEM:71.59% ratio:91.40% COMM Volume:8.00kB MEM Volume:8.50kB

87 MVMUL:2 MEM:3 LATENCY: 16480.0 COMM\_SYN:18.76% COMM\_TRANS:1.94% MVMUL:1000.00 MVMUL:6.07% VEC:0.00% MEM:10788.00 MEM:65.46% ratio:92.23% COMM Volume:8.00kB MEM Volume:8.50kB

88 MVMUL:2 MEM:3 LATENCY: 18080.0 COMM\_SYN:25.20% COMM\_TRANS:1.77% MVMUL:1000.00 MVMUL:5.53% VEC:0.00% MEM:10924.00 MEM:60.42% ratio:92.92% COMM Volume:8.00kB MEM Volume:8.50kB

89 MVMUL:2 MEM:3 LATENCY: 19680.0 COMM\_SYN:30.59% COMM\_TRANS:1.63% MVMUL:1000.00 MVMUL:5.08% VEC:0.00% MEM:11060.00 MEM:56.20% ratio:93.50% COMM Volume:8.00kB MEM Volume:8.50kB

90 MVMUL:2 MEM:3 LATENCY: 21280.0 COMM\_SYN:35.17% COMM\_TRANS:1.50% MVMUL:1000.00 MVMUL:4.70% VEC:0.00% MEM:11196.00 MEM:52.61% ratio:93.98% COMM Volume:8.00kB MEM Volume:8.50kB

91 MVMUL:2 MEM:3 LATENCY: 22880.0 COMM\_SYN:39.11% COMM\_TRANS:1.40% MVMUL:1000.00 MVMUL:4.37% VEC:0.00% MEM:11332.00 MEM:49.53% ratio:94.41% COMM Volume:8.00kB MEM Volume:8.50kB

92 MVMUL:2 MEM:3 LATENCY: 24480.0 COMM\_SYN:42.53% COMM\_TRANS:1.31% MVMUL:1000.00 MVMUL:4.08% VEC:0.00% MEM:11468.00 MEM:46.85% ratio:94.77% COMM Volume:8.00kB MEM Volume:8.50kB

93 MVMUL:2 MEM:3 LATENCY: 26080.0 COMM\_SYN:45.54% COMM\_TRANS:1.23% MVMUL:1000.00 MVMUL:3.83% VEC:0.00% MEM:11604.00 MEM:44.49% ratio:95.09% COMM Volume:8.00kB MEM Volume:8.50kB

94 MVMUL:2 MEM:3 LATENCY: 27680.0 COMM\_SYN:48.19% COMM\_TRANS:1.16% MVMUL:1000.00 MVMUL:3.61% VEC:0.00% MEM:11740.00 MEM:42.41% ratio:95.38% COMM Volume:8.00kB MEM Volume:8.50kB

95 MVMUL:2 MEM:3 LATENCY: 29280.0 COMM\_SYN:50.56% COMM\_TRANS:1.09% MVMUL:1000.00 MVMUL:3.42% VEC:0.00% MEM:11876.00 MEM:40.56% ratio:95.63% COMM Volume:8.00kB MEM Volume:8.50kB

96 MVMUL:2 MEM:3 LATENCY: 30880.0 COMM\_SYN:52.63% COMM\_TRANS:1.04% MVMUL:1000.00 MVMUL:3.24% VEC:0.00% MEM:12028.00 MEM:38.95% ratio:95.85% COMM Volume:8.00kB MEM Volume:8.50kB

97 MVMUL:2 MEM:3 LATENCY: 32480.0 COMM\_SYN:54.54% COMM\_TRANS:0.99% MVMUL:1000.00 MVMUL:3.08% VEC:0.00% MEM:12164.00 MEM:37.45% ratio:96.06% COMM Volume:8.00kB MEM Volume:8.50kB

98 MVMUL:2 MEM:3 LATENCY: 34080.0 COMM\_SYN:56.28% COMM\_TRANS:0.94% MVMUL:1000.00 MVMUL:2.93% VEC:0.00% MEM:12300.00 MEM:36.09% ratio:96.24% COMM Volume:8.00kB MEM Volume:8.50kB

99 MVMUL:2 MEM:3 LATENCY: 35680.0 COMM\_SYN:57.86% COMM\_TRANS:0.90% MVMUL:1000.00 MVMUL:2.80% VEC:0.00% MEM:12436.00 MEM:34.85% ratio:96.41% COMM Volume:8.00kB MEM Volume:8.50kB

100 MVMUL:8 MEM:10 LATENCY: 16911.0 COMM\_SYN:0.38% COMM\_TRANS:5.08% MVMUL:2200.00 MVMUL:13.01% VEC:5.68% MEM:12508.00 MEM:73.96% ratio:98.11% COMM Volume:5.86kB MEM Volume:5.91kB

101 MVMUL:8 MEM:9 LATENCY: 15139.0 COMM\_SYN:0.00% COMM\_TRANS:0.52% MVMUL:2200.00 MVMUL:14.53% VEC:0.00% MEM:12540.00 MEM:82.83% ratio:97.89% COMM Volume:1.95kB MEM Volume:3.95kB

102 MVMUL:8 MEM:9 LATENCY: 15538.0 COMM\_SYN:2.16% COMM\_TRANS:0.51% MVMUL:2200.00 MVMUL:14.16% VEC:0.00% MEM:12604.00 MEM:81.12% ratio:97.94% COMM Volume:1.95kB MEM Volume:3.95kB

103 MVMUL:8 MEM:9 LATENCY: 16559.0 COMM\_SYN:4.05% COMM\_TRANS:4.23% MVMUL:2200.00 MVMUL:13.29% VEC:0.00% MEM:12668.00 MEM:76.50% ratio:98.07% COMM Volume:1.95kB MEM Volume:3.95kB

104 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

105 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

106 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

107 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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109 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

110 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

111 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

112 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

113 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

114 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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120 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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122 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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124 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

125 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

126 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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128 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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131 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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133 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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137 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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139 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

140 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

141 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

142 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

143 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

practical (ns)

348345.00

MVMUL (#)

34903

VVADD (#)

34903

COMM (#)

2010

Volume (bytes)

952944

Cycles (ns)

96307

MEM (#)

38077

Volume (bytes)

7499008

Cycles (ns)

2131788

HT Volume (bytes)

0

Cycles (ns)

0

============================= OVERALL TIME =============================

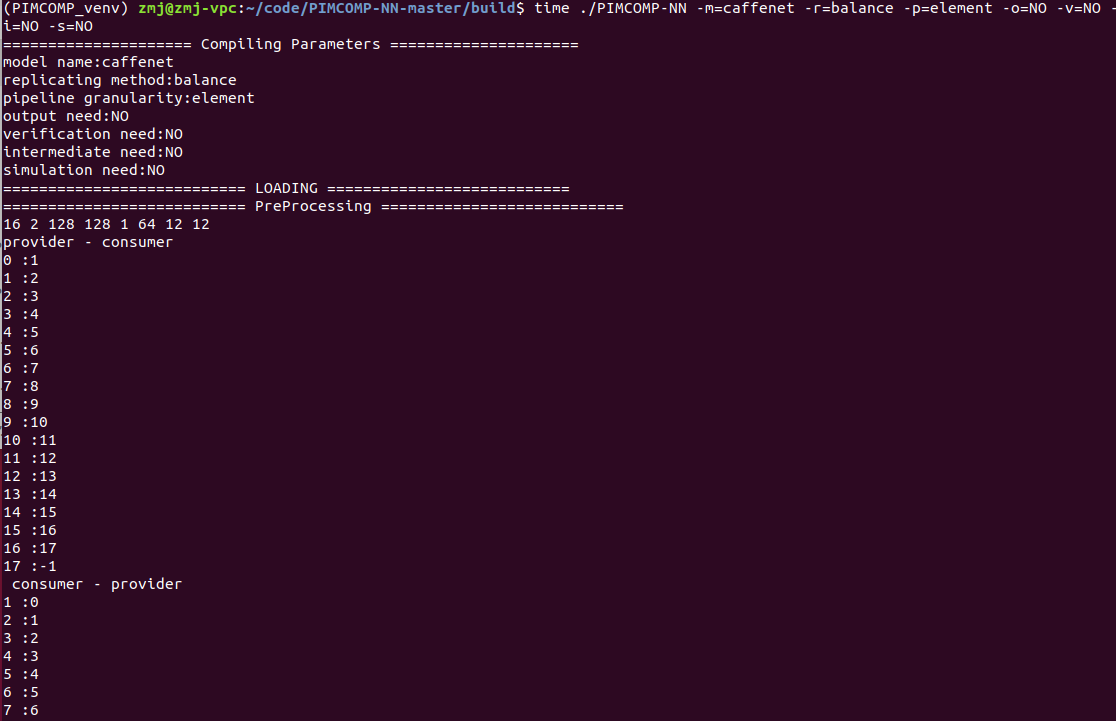
8.39s

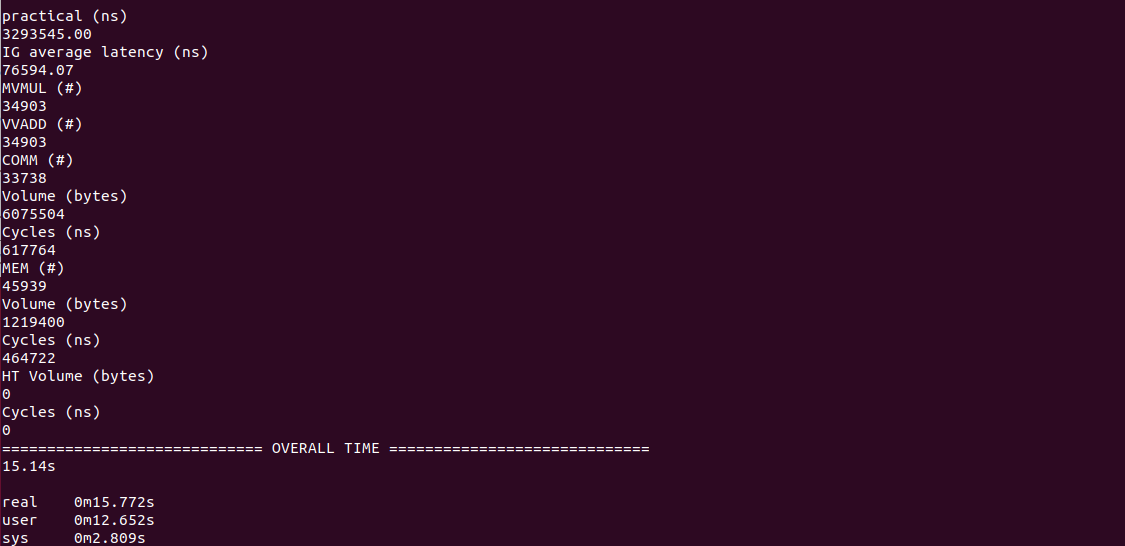
real 0m8.909s

user 0m5.508s

sys 0m3.117s

## HT





(PIMCOMP\_venv) zmj@zmj-vpc:~/code/PIMCOMP-NN-master/build$ time ./PIMCOMP-NN -m=caffenet -r=balance -p=element -o=NO -v=NO -i=NO -s=NO

===================== Compiling Parameters =====================

model name:caffenet

replicating method:balance

pipeline granularity:element

output need:NO

verification need:NO

intermediate need:NO

simulation need:NO

=========================== LOADING ===========================

=========================== PreProcessing ===========================

16 2 128 128 1 64 12 12

provider - consumer

0 :1

1 :2

2 :3

3 :4

4 :5

5 :6

6 :7

7 :8

8 :9

9 :10

10 :11

11 :12

12 :13

13 :14

14 :15

15 :16

16 :17

17 :-1

consumer - provider

1 :0

2 :1

3 :2

4 :3

5 :4

6 :5

7 :6

8 :7

9 :8

10 :9

11 :10

12 :11

13 :12

14 :13

15 :14

16 :15

17 :16

=========================== MODEL INFO ===========================

#Nodes in total: 18

1

input: 294kB

output: 546.75kB

Weight Matrix:363 × 96

min crossbar:1

4

input: 136.688kB

output: 364.5kB

Weight Matrix:2400 × 256

min crossbar:2

7

input: 84.5kB

output: 126.75kB

Weight Matrix:2304 × 384

min crossbar:3

8

input: 126.75kB

output: 126.75kB

Weight Matrix:3456 × 384

min crossbar:3

9

input: 126.75kB

output: 84.5kB

Weight Matrix:3456 × 256

min crossbar:2

12

output: 0.0078125MB

Weight Matrix:9216 × 4096

min crossbar:32

14

output: 0.0078125MB

Weight Matrix:4096 × 4096

min crossbar:32

16

output: 0.00190735MB

Weight Matrix:4096 × 1000

min crossbar:8

FC Weight: 111.812MB

Sum Weight: 118.957MB

FC Ratio: 93.994%

Output Sum:1.2375MB

Minimum Crossbar Num in One Core:32

=========================== REPLICATING ===========================

node:1 replication\_num:119

node:4 replication\_num:31

node:7 replication\_num:8

node:8 replication\_num:8

node:9 replication\_num:8

node:12 replication\_num:1

node:14 replication\_num:1

node:16 replication\_num:1

=========================== PARTITIONING ===========================

#RRAMs needed: 6631

#ArrayGroups needed: 1658

RRAMs Usage: 71.951%

Replication Check Pass!

============================= MAPPING =============================

0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64 64

split AG num: 0

Mapping Check Pass!

========================= ELEMENT PIPELINE SCHEDULING =========================

node:0 operation:OP\_INPUT core:0

node:2 operation:OP\_POOL core:2

node:3 operation:OP\_LRN core:3

node:5 operation:OP\_POOL core:5

node:6 operation:OP\_LRN core:6

node:10 operation:OP\_POOL core:10

node:11 operation:OP\_RESHAPE core:11

node:13 operation:OP\_DROPOUT core:13

node:15 operation:OP\_DROPOUT core:15

node:17 operation:OP\_SOFTMAX core:17

Element Pipeline Instruction Group Index: 0

max\_memory\_core\_index:2 52.3926 kB

Element Pipeline Instruction Group Index: 1

max\_memory\_core\_index:2 70.9551 kB

Element Pipeline Instruction Group Index: 2

max\_memory\_core\_index:2 69.2676 kB

Element Pipeline Instruction Group Index: 3

max\_memory\_core\_index:2 66.8301 kB

Element Pipeline Instruction Group Index: 4

max\_memory\_core\_index:2 65.4297 kB

Element Pipeline Instruction Group Index: 5

max\_memory\_core\_index:2 62.7051 kB

Element Pipeline Instruction Group Index: 6

max\_memory\_core\_index:5 74.5977 kB

Element Pipeline Instruction Group Index: 7

max\_memory\_core\_index:5 69.3477 kB

Element Pipeline Instruction Group Index: 8

max\_memory\_core\_index:5 75.4102 kB

Element Pipeline Instruction Group Index: 9

max\_memory\_core\_index:2 71.2422 kB

Element Pipeline Instruction Group Index: 10

max\_memory\_core\_index:5 74.0977 kB

Element Pipeline Instruction Group Index: 11

max\_memory\_core\_index:2 70.5801 kB

Element Pipeline Instruction Group Index: 12

max\_memory\_core\_index:5 79.8477 kB

Element Pipeline Instruction Group Index: 13

max\_memory\_core\_index:5 68.5352 kB

Element Pipeline Instruction Group Index: 14

max\_memory\_core\_index:5 78.2227 kB

Element Pipeline Instruction Group Index: 15

max\_memory\_core\_index:5 72.7227 kB

Element Pipeline Instruction Group Index: 16

max\_memory\_core\_index:5 73.6602 kB

Element Pipeline Instruction Group Index: 17

max\_memory\_core\_index:5 76.1602 kB

Element Pipeline Instruction Group Index: 18

max\_memory\_core\_index:2 69.3906 kB

Element Pipeline Instruction Group Index: 19

max\_memory\_core\_index:5 77.8477 kB

Element Pipeline Instruction Group Index: 20

max\_memory\_core\_index:2 72.6426 kB

Element Pipeline Instruction Group Index: 21

max\_memory\_core\_index:5 77.2852 kB

Element Pipeline Instruction Group Index: 22

max\_memory\_core\_index:2 68.5176 kB

Element Pipeline Instruction Group Index: 23

max\_memory\_core\_index:5 78.9043 kB

Element Pipeline Instruction Group Index: 24

max\_memory\_core\_index:5 68.6543 kB

Element Pipeline Instruction Group Index: 25

max\_memory\_core\_index:5 73.4043 kB

Element Pipeline Instruction Group Index: 26

max\_memory\_core\_index:5 68.9043 kB

Element Pipeline Instruction Group Index: 27

max\_memory\_core\_index:5 63.4043 kB

Element Pipeline Instruction Group Index: 28

max\_memory\_core\_index:5 66.5918 kB

Element Pipeline Instruction Group Index: 29

max\_memory\_core\_index:46 43.25 kB

Element Pipeline Instruction Group Index: 30

max\_memory\_core\_index:46 43.25 kB

Element Pipeline Instruction Group Index: 31

max\_memory\_core\_index:46 42.5 kB

Element Pipeline Instruction Group Index: 32

max\_memory\_core\_index:44 42.5 kB

Element Pipeline Instruction Group Index: 33

max\_memory\_core\_index:44 42.5 kB

Element Pipeline Instruction Group Index: 34

max\_memory\_core\_index:10 41.875 kB

Element Pipeline Instruction Group Index: 35

max\_memory\_core\_index:44 41 kB

Element Pipeline Instruction Group Index: 36

max\_memory\_core\_index:10 36.875 kB

Element Pipeline Instruction Group Index: 37

max\_memory\_core\_index:10 40.875 kB

Element Pipeline Instruction Group Index: 38

max\_memory\_core\_index:10 34.875 kB

Element Pipeline Instruction Group Index: 39

max\_memory\_core\_index:0 27.3262 kB

Element Pipeline Instruction Group Index: 40

max\_memory\_core\_index:0 27.3262 kB

Element Pipeline Instruction Group Index: 41

max\_memory\_core\_index:0 27.3262 kB

Element Pipeline Instruction Group Index: 42

max\_memory\_core\_index:0 0 kB

[effective\_instruction\_group\_num]:43

================= Check Result =================

Node Expected Index Num

1: 2916 2916 2916

2: 729 729 729

4: 729 729 729

5: 169 169 169

7: 169 169 169

8: 169 169 169

9: 169 169 169

10: 36 36 36

12: 1 1 1

14: 1 1 1

16: 1 1 1

----------------- PASS -----------------

=========================== OPTIMIZATION ===========================

============================= PLACING =============================

============================= EVALUATING =============================

instruction\_group\_num:43

0 MVMUL:1600 MEM:7990 LATENCY: 2649352.0 COMM\_SYN:87.05% COMM\_TRANS:0.18% MVMUL:335000.00 MVMUL:12.64% VEC:0.03% MEM:121.00 MEM:0.00% ratio:99.91% COMM Volume:107.81kB MEM Volume:132.92kB

1 MVMUL:1600 MEM:8721 LATENCY: 2649520.0 COMM\_SYN:86.10% COMM\_TRANS:0.17% MVMUL:350000.00 MVMUL:13.21% VEC:0.03% MEM:363.00 MEM:0.01% ratio:99.52% COMM Volume:107.81kB MEM Volume:134.30kB

2 MVMUL:1588 MEM:8029 LATENCY: 2751530.0 COMM\_SYN:74.65% COMM\_TRANS:5.31% MVMUL:347600.00 MVMUL:12.63% VEC:6.91% MEM:1496.00 MEM:0.05% ratio:99.56% COMM Volume:2190.56kB MEM Volume:131.10kB

3 MVMUL:1536 MEM:7662 LATENCY: 2543964.0 COMM\_SYN:86.94% COMM\_TRANS:0.17% MVMUL:321600.00 MVMUL:12.64% VEC:0.03% MEM:3066.00 MEM:0.12% ratio:99.90% COMM Volume:103.50kB MEM Volume:127.46kB

4 MVMUL:1536 MEM:7918 LATENCY: 2544132.0 COMM\_SYN:85.91% COMM\_TRANS:0.17% MVMUL:336000.00 MVMUL:13.21% VEC:0.03% MEM:5059.00 MEM:0.20% ratio:99.52% COMM Volume:103.50kB MEM Volume:129.08kB

5 MVMUL:1200 MEM:5518 LATENCY: 3050186.0 COMM\_SYN:84.73% COMM\_TRANS:1.93% MVMUL:271800.00 MVMUL:8.91% VEC:3.86% MEM:4196.00 MEM:0.14% ratio:99.57% COMM Volume:1004.62kB MEM Volume:85.40kB

6 MVMUL:768 MEM:1 LATENCY: 2956504.0 COMM\_SYN:91.34% COMM\_TRANS:2.19% MVMUL:182400.00 MVMUL:6.17% VEC:0.06% MEM:809.00 MEM:0.03% ratio:99.79% COMM Volume:144.19kB MEM Volume:0.50kB

7 MVMUL:768 MEM:1 LATENCY: 2960374.0 COMM\_SYN:93.33% COMM\_TRANS:0.23% MVMUL:182400.00 MVMUL:6.16% VEC:0.06% MEM:817.00 MEM:0.03% ratio:99.82% COMM Volume:141.38kB MEM Volume:0.50kB

8 MVMUL:768 MEM:1 LATENCY: 2963854.0 COMM\_SYN:93.26% COMM\_TRANS:0.29% MVMUL:182400.00 MVMUL:6.15% VEC:0.06% MEM:825.00 MEM:0.03% ratio:99.80% COMM Volume:129.38kB MEM Volume:0.50kB

9 MVMUL:768 MEM:1 LATENCY: 2969974.0 COMM\_SYN:93.33% COMM\_TRANS:0.30% MVMUL:183000.00 MVMUL:6.16% VEC:0.06% MEM:833.00 MEM:0.03% ratio:99.88% COMM Volume:144.75kB MEM Volume:0.50kB

10 MVMUL:768 MEM:1 LATENCY: 3250396.0 COMM\_SYN:93.05% COMM\_TRANS:0.31% MVMUL:182400.00 MVMUL:5.61% VEC:0.81% MEM:841.00 MEM:0.03% ratio:99.81% COMM Volume:243.69kB MEM Volume:0.50kB

11 MVMUL:768 MEM:1 LATENCY: 2978556.0 COMM\_SYN:93.34% COMM\_TRANS:0.24% MVMUL:182400.00 MVMUL:6.12% VEC:0.06% MEM:849.00 MEM:0.03% ratio:99.79% COMM Volume:129.19kB MEM Volume:0.50kB

12 MVMUL:768 MEM:1 LATENCY: 2984878.0 COMM\_SYN:93.39% COMM\_TRANS:0.20% MVMUL:182400.00 MVMUL:6.11% VEC:0.06% MEM:857.00 MEM:0.03% ratio:99.79% COMM Volume:144.75kB MEM Volume:0.50kB

13 MVMUL:768 MEM:1 LATENCY: 2989978.0 COMM\_SYN:93.37% COMM\_TRANS:0.20% MVMUL:183000.00 MVMUL:6.12% VEC:0.06% MEM:865.00 MEM:0.03% ratio:99.79% COMM Volume:141.00kB MEM Volume:0.50kB

14 MVMUL:768 MEM:1 LATENCY: 2993858.0 COMM\_SYN:93.43% COMM\_TRANS:0.18% MVMUL:182400.00 MVMUL:6.09% VEC:0.06% MEM:873.00 MEM:0.03% ratio:99.79% COMM Volume:128.06kB MEM Volume:0.50kB

15 MVMUL:739 MEM:1 LATENCY: 2996560.0 COMM\_SYN:93.62% COMM\_TRANS:0.19% MVMUL:176600.00 MVMUL:5.89% VEC:0.06% MEM:913.00 MEM:0.03% ratio:99.79% COMM Volume:137.25kB MEM Volume:0.50kB

16 MVMUL:736 MEM:1 LATENCY: 3001880.0 COMM\_SYN:93.69% COMM\_TRANS:0.20% MVMUL:174800.00 MVMUL:5.82% VEC:0.06% MEM:921.00 MEM:0.03% ratio:99.80% COMM Volume:139.38kB MEM Volume:0.50kB

17 MVMUL:736 MEM:1 LATENCY: 3005950.0 COMM\_SYN:93.72% COMM\_TRANS:0.17% MVMUL:174800.00 MVMUL:5.82% VEC:0.06% MEM:929.00 MEM:0.03% ratio:99.80% COMM Volume:124.50kB MEM Volume:0.50kB

18 MVMUL:736 MEM:1 LATENCY: 3012664.0 COMM\_SYN:93.71% COMM\_TRANS:0.20% MVMUL:174800.00 MVMUL:5.80% VEC:0.06% MEM:937.00 MEM:0.03% ratio:99.80% COMM Volume:136.19kB MEM Volume:0.50kB

19 MVMUL:736 MEM:1 LATENCY: 3018164.0 COMM\_SYN:93.72% COMM\_TRANS:0.21% MVMUL:174800.00 MVMUL:5.79% VEC:0.06% MEM:945.00 MEM:0.03% ratio:99.81% COMM Volume:139.56kB MEM Volume:0.50kB

20 MVMUL:736 MEM:1 LATENCY: 3022446.0 COMM\_SYN:93.73% COMM\_TRANS:0.19% MVMUL:174800.00 MVMUL:5.78% VEC:0.06% MEM:953.00 MEM:0.03% ratio:99.80% COMM Volume:124.50kB MEM Volume:0.50kB

21 MVMUL:736 MEM:1 LATENCY: 3029366.0 COMM\_SYN:93.83% COMM\_TRANS:0.21% MVMUL:174800.00 MVMUL:5.77% VEC:0.06% MEM:961.00 MEM:0.03% ratio:99.90% COMM Volume:135.81kB MEM Volume:0.50kB

22 MVMUL:736 MEM:1 LATENCY: 3035066.0 COMM\_SYN:93.74% COMM\_TRANS:0.19% MVMUL:175400.00 MVMUL:5.78% VEC:0.06% MEM:969.00 MEM:0.03% ratio:99.80% COMM Volume:139.19kB MEM Volume:0.50kB

23 MVMUL:736 MEM:1 LATENCY: 3039446.0 COMM\_SYN:93.86% COMM\_TRANS:0.16% MVMUL:174800.00 MVMUL:5.75% VEC:0.00% MEM:977.00 MEM:0.03% ratio:99.80% COMM Volume:113.94kB MEM Volume:0.50kB

24 MVMUL:459 MEM:1 LATENCY: 3138446.0 COMM\_SYN:95.88% COMM\_TRANS:0.46% MVMUL:105600.00 MVMUL:3.36% VEC:0.08% MEM:989.00 MEM:0.03% ratio:99.81% COMM Volume:319.75kB MEM Volume:0.75kB

25 MVMUL:441 MEM:1 LATENCY: 3119266.0 COMM\_SYN:95.11% COMM\_TRANS:0.93% MVMUL:113400.00 MVMUL:3.64% VEC:0.08% MEM:1001.00 MEM:0.03% ratio:99.79% COMM Volume:217.25kB MEM Volume:0.75kB

26 MVMUL:441 MEM:1 LATENCY: 3119326.0 COMM\_SYN:95.62% COMM\_TRANS:0.41% MVMUL:113400.00 MVMUL:3.64% VEC:0.08% MEM:1048.00 MEM:0.03% ratio:99.78% COMM Volume:218.50kB MEM Volume:0.75kB

27 MVMUL:441 MEM:1 LATENCY: 3119386.0 COMM\_SYN:95.67% COMM\_TRANS:0.33% MVMUL:113400.00 MVMUL:3.64% VEC:0.08% MEM:1060.00 MEM:0.03% ratio:99.76% COMM Volume:214.50kB MEM Volume:0.75kB

28 MVMUL:441 MEM:1 LATENCY: 3122406.0 COMM\_SYN:95.66% COMM\_TRANS:0.34% MVMUL:113400.00 MVMUL:3.63% VEC:0.08% MEM:1072.00 MEM:0.03% ratio:99.75% COMM Volume:216.50kB MEM Volume:0.75kB

29 MVMUL:441 MEM:1 LATENCY: 3119476.0 COMM\_SYN:95.70% COMM\_TRANS:0.38% MVMUL:113400.00 MVMUL:3.64% VEC:0.00% MEM:1084.00 MEM:0.03% ratio:99.75% COMM Volume:197.25kB MEM Volume:0.75kB

30 MVMUL:444 MEM:2 LATENCY: 3203626.0 COMM\_SYN:95.07% COMM\_TRANS:1.29% MVMUL:103800.00 MVMUL:3.24% VEC:0.16% MEM:1108.00 MEM:0.03% ratio:99.80% COMM Volume:348.75kB MEM Volume:1.50kB

31 MVMUL:462 MEM:1 LATENCY: 3174606.0 COMM\_SYN:96.16% COMM\_TRANS:0.38% MVMUL:105600.00 MVMUL:3.33% VEC:0.00% MEM:1120.00 MEM:0.04% ratio:99.90% COMM Volume:108.75kB MEM Volume:0.75kB

32 MVMUL:444 MEM:1 LATENCY: 3197636.0 COMM\_SYN:95.64% COMM\_TRANS:0.42% MVMUL:114600.00 MVMUL:3.58% VEC:0.08% MEM:1132.00 MEM:0.04% ratio:99.75% COMM Volume:235.50kB MEM Volume:0.75kB

33 MVMUL:441 MEM:1 LATENCY: 3197666.0 COMM\_SYN:95.82% COMM\_TRANS:0.28% MVMUL:113400.00 MVMUL:3.55% VEC:0.08% MEM:1144.00 MEM:0.04% ratio:99.76% COMM Volume:206.25kB MEM Volume:0.75kB

34 MVMUL:441 MEM:1 LATENCY: 3203656.0 COMM\_SYN:95.74% COMM\_TRANS:0.36% MVMUL:113400.00 MVMUL:3.54% VEC:0.08% MEM:1178.00 MEM:0.04% ratio:99.76% COMM Volume:210.00kB MEM Volume:0.75kB

35 MVMUL:441 MEM:1 LATENCY: 3185046.0 COMM\_SYN:96.49% COMM\_TRANS:0.22% MVMUL:100800.00 MVMUL:3.16% VEC:0.00% MEM:1190.00 MEM:0.04% ratio:99.91% COMM Volume:105.00kB MEM Volume:0.75kB

36 MVMUL:441 MEM:1 LATENCY: 3203686.0 COMM\_SYN:96.31% COMM\_TRANS:0.26% MVMUL:100800.00 MVMUL:3.15% VEC:0.08% MEM:1202.00 MEM:0.04% ratio:99.83% COMM Volume:189.00kB MEM Volume:0.75kB

37 MVMUL:441 MEM:1 LATENCY: 3203716.0 COMM\_SYN:95.75% COMM\_TRANS:0.35% MVMUL:113400.00 MVMUL:3.54% VEC:0.08% MEM:1214.00 MEM:0.04% ratio:99.76% COMM Volume:207.75kB MEM Volume:0.75kB

38 MVMUL:441 MEM:1 LATENCY: 3203746.0 COMM\_SYN:95.77% COMM\_TRANS:0.33% MVMUL:113400.00 MVMUL:3.54% VEC:0.08% MEM:1226.00 MEM:0.04% ratio:99.76% COMM Volume:208.50kB MEM Volume:0.75kB

39 MVMUL:441 MEM:1 LATENCY: 3203776.0 COMM\_SYN:95.57% COMM\_TRANS:0.46% MVMUL:113400.00 MVMUL:3.54% VEC:0.16% MEM:1238.00 MEM:0.04% ratio:99.76% COMM Volume:249.75kB MEM Volume:0.75kB

40 MVMUL:441 MEM:1 LATENCY: 3186946.0 COMM\_SYN:96.44% COMM\_TRANS:0.26% MVMUL:100800.00 MVMUL:3.16% VEC:0.00% MEM:1250.00 MEM:0.04% ratio:99.91% COMM Volume:105.75kB MEM Volume:0.75kB

41 MVMUL:657 MEM:2 LATENCY: 3237466.0 COMM\_SYN:94.63% COMM\_TRANS:0.28% MVMUL:157200.00 MVMUL:4.86% VEC:0.00% MEM:1304.00 MEM:0.04% ratio:99.81% COMM Volume:161.00kB MEM Volume:1.25kB

42 MVMUL:672 MEM:1 LATENCY: 3223856.0 COMM\_SYN:94.89% COMM\_TRANS:0.31% MVMUL:147600.00 MVMUL:4.58% VEC:0.05% MEM:1312.00 MEM:0.04% ratio:99.88% COMM Volume:148.50kB MEM Volume:0.50kB

43 MVMUL:672 MEM:1 LATENCY: 3237486.0 COMM\_SYN:94.53% COMM\_TRANS:0.28% MVMUL:159600.00 MVMUL:4.93% VEC:0.05% MEM:1320.00 MEM:0.04% ratio:99.83% COMM Volume:136.50kB MEM Volume:0.50kB

44 MVMUL:672 MEM:1 LATENCY: 3237506.0 COMM\_SYN:94.53% COMM\_TRANS:0.28% MVMUL:159600.00 MVMUL:4.93% VEC:0.05% MEM:1328.00 MEM:0.04% ratio:99.83% COMM Volume:135.75kB MEM Volume:0.50kB

45 MVMUL:672 MEM:1 LATENCY: 3237526.0 COMM\_SYN:94.54% COMM\_TRANS:0.27% MVMUL:159600.00 MVMUL:4.93% VEC:0.05% MEM:1336.00 MEM:0.04% ratio:99.83% COMM Volume:134.25kB MEM Volume:0.50kB

46 MVMUL:672 MEM:1 LATENCY: 3242296.0 COMM\_SYN:94.55% COMM\_TRANS:0.27% MVMUL:159600.00 MVMUL:4.92% VEC:0.05% MEM:1344.00 MEM:0.04% ratio:99.83% COMM Volume:149.25kB MEM Volume:0.50kB

47 MVMUL:609 MEM:1 LATENCY: 3248296.0 COMM\_SYN:95.02% COMM\_TRANS:0.25% MVMUL:147000.00 MVMUL:4.53% VEC:0.00% MEM:1352.00 MEM:0.04% ratio:99.83% COMM Volume:138.00kB MEM Volume:0.50kB

48 MVMUL:2 MEM:1 LATENCY: 3263856.0 COMM\_SYN:97.97% COMM\_TRANS:0.51% MVMUL:1000.00 MVMUL:0.03% VEC:1.37% MEM:1512.00 MEM:0.05% ratio:99.92% COMM Volume:408.50kB MEM Volume:8.00kB

49 MVMUL:2 MEM:1 LATENCY: 2269739.0 COMM\_SYN:99.81% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:1702.00 MEM:0.07% ratio:99.94% COMM Volume:8.50kB MEM Volume:8.00kB

50 MVMUL:2 MEM:1 LATENCY: 2271339.0 COMM\_SYN:99.80% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:1855.00 MEM:0.08% ratio:99.94% COMM Volume:8.50kB MEM Volume:8.00kB

51 MVMUL:2 MEM:1 LATENCY: 2272939.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:2026.00 MEM:0.09% ratio:99.94% COMM Volume:8.50kB MEM Volume:8.00kB

52 MVMUL:2 MEM:1 LATENCY: 2274539.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:2179.00 MEM:0.10% ratio:99.94% COMM Volume:8.50kB MEM Volume:8.00kB

53 MVMUL:2 MEM:1 LATENCY: 2408085.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:2338.00 MEM:0.10% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

54 MVMUL:2 MEM:1 LATENCY: 2651016.0 COMM\_SYN:99.81% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:2508.00 MEM:0.09% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

55 MVMUL:2 MEM:1 LATENCY: 2652696.0 COMM\_SYN:99.79% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:2820.00 MEM:0.11% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

56 MVMUL:2 MEM:1 LATENCY: 2753730.0 COMM\_SYN:99.80% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:2948.00 MEM:0.11% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

57 MVMUL:2 MEM:1 LATENCY: 2755330.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:3076.00 MEM:0.11% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

58 MVMUL:2 MEM:1 LATENCY: 2756930.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:3204.00 MEM:0.12% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

59 MVMUL:2 MEM:1 LATENCY: 2758530.0 COMM\_SYN:99.78% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.04% VEC:0.00% MEM:3332.00 MEM:0.12% ratio:99.95% COMM Volume:8.50kB MEM Volume:8.00kB

60 MVMUL:2 MEM:1 LATENCY: 2978856.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:3460.00 MEM:0.12% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

61 MVMUL:2 MEM:1 LATENCY: 2980456.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:3588.00 MEM:0.12% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

62 MVMUL:2 MEM:1 LATENCY: 2982056.0 COMM\_SYN:99.79% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:3716.00 MEM:0.12% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

63 MVMUL:2 MEM:1 LATENCY: 2983676.0 COMM\_SYN:99.78% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:3844.00 MEM:0.13% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

64 MVMUL:2 MEM:1 LATENCY: 2985276.0 COMM\_SYN:99.78% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:3972.00 MEM:0.13% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

65 MVMUL:2 MEM:1 LATENCY: 2986876.0 COMM\_SYN:99.77% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4100.00 MEM:0.14% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

66 MVMUL:2 MEM:1 LATENCY: 3086186.0 COMM\_SYN:99.78% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4228.00 MEM:0.14% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

67 MVMUL:2 MEM:1 LATENCY: 3108966.0 COMM\_SYN:99.77% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4356.00 MEM:0.14% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

68 MVMUL:2 MEM:1 LATENCY: 3110566.0 COMM\_SYN:99.77% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4484.00 MEM:0.14% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

69 MVMUL:2 MEM:1 LATENCY: 3112226.0 COMM\_SYN:99.77% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4612.00 MEM:0.15% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

70 MVMUL:2 MEM:1 LATENCY: 3113826.0 COMM\_SYN:99.76% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4740.00 MEM:0.15% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

71 MVMUL:2 MEM:1 LATENCY: 3127336.0 COMM\_SYN:99.76% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4868.00 MEM:0.16% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

72 MVMUL:2 MEM:1 LATENCY: 3179826.0 COMM\_SYN:99.76% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:4996.00 MEM:0.16% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

73 MVMUL:2 MEM:1 LATENCY: 3181426.0 COMM\_SYN:99.76% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5124.00 MEM:0.16% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

74 MVMUL:2 MEM:1 LATENCY: 3183026.0 COMM\_SYN:99.75% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5252.00 MEM:0.17% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

75 MVMUL:2 MEM:1 LATENCY: 3184626.0 COMM\_SYN:99.75% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5380.00 MEM:0.17% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

76 MVMUL:2 MEM:1 LATENCY: 3207796.0 COMM\_SYN:99.75% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5508.00 MEM:0.17% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

77 MVMUL:2 MEM:1 LATENCY: 3209396.0 COMM\_SYN:99.74% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5636.00 MEM:0.18% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

78 MVMUL:2 MEM:1 LATENCY: 3240026.0 COMM\_SYN:99.74% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5764.00 MEM:0.18% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

79 MVMUL:2 MEM:1 LATENCY: 3241626.0 COMM\_SYN:99.74% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:5892.00 MEM:0.18% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

80 MVMUL:2 MEM:1 LATENCY: 3243226.0 COMM\_SYN:99.73% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6020.00 MEM:0.19% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

81 MVMUL:2 MEM:1 LATENCY: 3252976.0 COMM\_SYN:99.73% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6148.00 MEM:0.19% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

82 MVMUL:2 MEM:1 LATENCY: 3254576.0 COMM\_SYN:99.73% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6276.00 MEM:0.19% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

83 MVMUL:2 MEM:1 LATENCY: 3256176.0 COMM\_SYN:99.72% COMM\_TRANS:0.01% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6404.00 MEM:0.20% ratio:99.96% COMM Volume:8.50kB MEM Volume:8.00kB

84 MVMUL:2 MEM:1 LATENCY: 3290416.0 COMM\_SYN:98.85% COMM\_TRANS:0.26% MVMUL:1000.00 MVMUL:0.03% VEC:0.58% MEM:6532.00 MEM:0.20% ratio:99.92% COMM Volume:160.00kB MEM Volume:8.00kB

85 MVMUL:2 MEM:1 LATENCY: 3264176.0 COMM\_SYN:99.64% COMM\_TRANS:0.09% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6660.00 MEM:0.20% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

86 MVMUL:2 MEM:1 LATENCY: 3265776.0 COMM\_SYN:99.70% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6788.00 MEM:0.21% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

87 MVMUL:2 MEM:1 LATENCY: 3267376.0 COMM\_SYN:99.70% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:6916.00 MEM:0.21% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

88 MVMUL:2 MEM:1 LATENCY: 3268976.0 COMM\_SYN:99.69% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7044.00 MEM:0.22% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

89 MVMUL:2 MEM:1 LATENCY: 3270576.0 COMM\_SYN:99.69% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7172.00 MEM:0.22% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

90 MVMUL:2 MEM:1 LATENCY: 3272176.0 COMM\_SYN:99.69% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7300.00 MEM:0.22% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

91 MVMUL:2 MEM:1 LATENCY: 3273776.0 COMM\_SYN:99.68% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7428.00 MEM:0.23% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

92 MVMUL:2 MEM:1 LATENCY: 3275376.0 COMM\_SYN:99.68% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7556.00 MEM:0.23% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

93 MVMUL:2 MEM:1 LATENCY: 3276976.0 COMM\_SYN:99.68% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7684.00 MEM:0.23% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

94 MVMUL:2 MEM:1 LATENCY: 3278576.0 COMM\_SYN:99.67% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7812.00 MEM:0.24% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

95 MVMUL:2 MEM:1 LATENCY: 3280176.0 COMM\_SYN:99.67% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:7940.00 MEM:0.24% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

96 MVMUL:2 MEM:1 LATENCY: 3281776.0 COMM\_SYN:99.66% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:8068.00 MEM:0.25% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

97 MVMUL:2 MEM:1 LATENCY: 3283376.0 COMM\_SYN:99.66% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:8196.00 MEM:0.25% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

98 MVMUL:2 MEM:1 LATENCY: 3284976.0 COMM\_SYN:99.66% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:8324.00 MEM:0.25% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

99 MVMUL:2 MEM:1 LATENCY: 3286576.0 COMM\_SYN:99.65% COMM\_TRANS:0.02% MVMUL:1000.00 MVMUL:0.03% VEC:0.00% MEM:8452.00 MEM:0.26% ratio:99.96% COMM Volume:16.00kB MEM Volume:8.00kB

100 MVMUL:8 MEM:2 LATENCY: 3293545.0 COMM\_SYN:99.62% COMM\_TRANS:0.02% MVMUL:2200.00 MVMUL:0.07% VEC:0.03% MEM:8516.00 MEM:0.26% ratio:99.99% COMM Volume:13.86kB MEM Volume:3.91kB

101 MVMUL:8 MEM:1 LATENCY: 3292395.0 COMM\_SYN:99.65% COMM\_TRANS:0.01% MVMUL:2200.00 MVMUL:0.07% VEC:0.00% MEM:8516.00 MEM:0.26% ratio:99.99% COMM Volume:9.95kB MEM Volume:1.95kB

102 MVMUL:8 MEM:1 LATENCY: 3292794.0 COMM\_SYN:99.65% COMM\_TRANS:0.01% MVMUL:2200.00 MVMUL:0.07% VEC:0.00% MEM:8548.00 MEM:0.26% ratio:99.99% COMM Volume:9.95kB MEM Volume:1.95kB

103 MVMUL:8 MEM:1 LATENCY: 3293193.0 COMM\_SYN:99.65% COMM\_TRANS:0.01% MVMUL:2200.00 MVMUL:0.07% VEC:0.00% MEM:8580.00 MEM:0.26% ratio:99.99% COMM Volume:9.95kB MEM Volume:1.95kB

104 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

105 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

106 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

107 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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112 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

113 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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120 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

121 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

122 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

123 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

124 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

125 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

126 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

127 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

128 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

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140 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

141 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

142 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

143 MVMUL:0 MEM:0 LATENCY: 0.0 COMM\_SYN:-nan% COMM\_TRANS:-nan% MVMUL:0.00 MVMUL:-nan% VEC:-nan% MEM:0.00 MEM:-nan% ratio:-nan% COMM Volume:0.00kB MEM Volume:0.00kB

practical (ns)

3293545.00

IG average latency (ns)

76594.07

MVMUL (#)

34903

VVADD (#)

34903

COMM (#)

33738

Volume (bytes)

6075504

Cycles (ns)

617764

MEM (#)

45939

Volume (bytes)

1219400

Cycles (ns)

464722

HT Volume (bytes)

0

Cycles (ns)

0

============================= OVERALL TIME =============================

15.14s

real 0m15.772s

user 0m12.652s

sys 0m2.809s