

Terms	Meaning
MPI_Call_Duration	Duration of mean of sampled MPI calls, this metric tracks the time spent in an MPI call so far
MPI Calls	Number of MPI calls per second per process
MPI Point to Point Calls /s	This pair of metrics tracks the number of point-to-point calls per second per process
MPI_Finalize()	Percentage of total time spent on MPI_Finalize function on main thread by all processors- function to finish all MPI calls and exit
MPI Collective Calls /s	This pair of metrics tracks the number of collective calls per second per process
MPI_comm_barrier()	Percentage of total time spent on MPI_comm_barrier function on main thread by all processors- function for waiting for all processors to reach the point
Memory	Amount of physical memory used by each process
MPI_comm_dup	Percentage of total time spent on MPI_comm_dup function on main thread by all processors- function for creating duplicate communicators
Time	The total execution time of the program

BLOCKING SEND AND RECEIVE USING PYTHON OBJECTS

(sr_normal.py)

Processors	Size	MPI_Call_Duration (ms)		MPI calls (/s)	MPI Point to Point calls (/s)		MPI_Finalize()	Time (s)		
64	100000	0.0098		0.85	0.3		6.8 %	3.362		
64	1000000	0.38		0.30	0.15		23.0 %	6.712		
64	10000000	8.84		0.05	0.03		42.0 %	37.684		

BLOCKING SEND AND RECEIVE USING NUMPY

(sr_numpy.py)

Processors	Size	MPI_Call_Duration(ms)	MPI calls(/s)	MPI Point to Point Calls(/s)	MPI_Finalize()	Time (s)
64	100000	0.00192	0.66	0.74	1.5 %	3.24
64	1000000	0.00452	1.1	0.34	4.2 %	4.375
64	10000000	0.09	1.17	0.46	7.5 %	4.453

NON BLOCKING SEND AND RECEIVE USING NUMPY

(sr_comparision.py)

Processors	Size	MPI_Call_Duration(ms)	MPI calls (/s)	MPI Point to Point Calls(/s)	MPI_Finalize()	Time(s)		
64	100000	0.00242	2	0.57	2.2 %	3.12		
64	1000000	0.0021	1.76	0.55	2.2 %	3.376		
64	10000000	0.00311	1.13	0.44	3.5 %	3.99		

MPI REDUCE

```
(reduce.py)
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[illegible]

128	23.2		14.3	1.2		1.134		19.8	
160	26.7		12.1	1.23		1.153		16.3	
192	29.3		12	1.69		1.443		18.8	
224	29.6		18.5	2.08		1.448		24	
MPI GATHER									
						(gather.py)			
Processors	MPI Call Duration(ms)		MPI Calls(/s)	MPI Collective Calls(/s)		Time(s)			
128	25.1		3.29	3.29		0.942			
160	28.2		3.36	3.36		0.972			
192	29.5		3.3	3.3		0.945			
224	39.9		4.18	4.18		0.984			
MPI BROADCAST									
						(broadcast.py)			
Processors	Size	MPI_Call_Duration(ms)		MPI calls (/s)	MPI Collective Calls(/s)	Time(s)			
64	100000	4.57		26	26	3.12			
64	1000000	36.6		12.6	12.6	3.376			
64	10000000	380		0.82	0.82	3.99			
MPI SCATTER									
						(scatter.py)			
Processors	MPI Call Duration(ms)		MPI Calls(/s)	MPI Collective Calls(/s)		Time(s)			
64	0.58		0.82	0.82		4.019			
96	5.23		0.66	0.66		3.103			
128	9.44		0.6	0.6		3.461			
MPI IREDUCE									
						(nonblock_reduce.py)			
Processors	MPI Call Duration(ms)		MPI Calls(/s)	MPI Collective Calls(/s)		Time(s)	MPI_comm_barrier(%)		
128	0.02		26.2	26.2		0.454	0.7		
160	0.29		23.9	23.9		0.413	3.7		
192	3.1		18.3	18.3		0.473	3.2		
224	6.99		12.2	12.2		0.512	18.8		

