Outline of the report

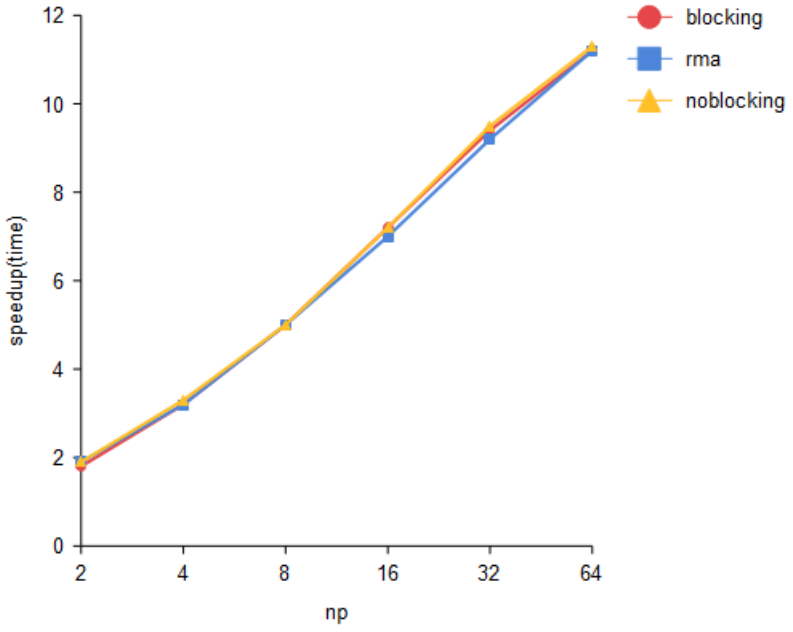
Serial

grid size	1600*400	1200*300
time(s)	4250.633	1773.141

MPI

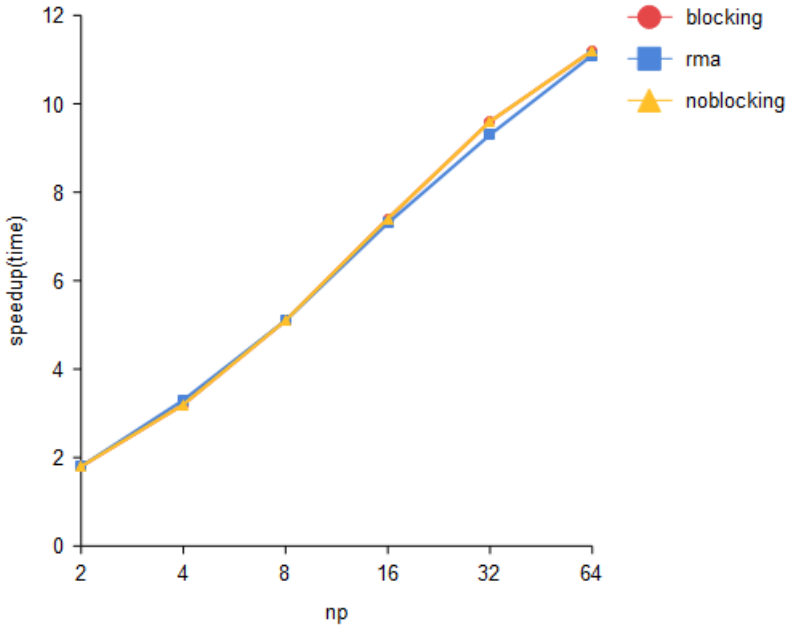
	np \ time(s)	blocking	rma	noblocking
grid size = 1600*400	2	2350.1	2287.194	2287.077
	4	1310.905	1321.401	1296.423
	8	843.483	846.664	843.649
	16	586.354	603.762	588.463
	32	451.438	462.334	448.229
	64	379.448	380.123	376.866

	np \ speedup(time)	blocking	rma	noblocking
grid size = 1600*400	2	1.8	1.9	1.9
	4	3.2	3.2	3.3
	8	5.0	5.0	5.0
	16	7.2	7.0	7.2
	32	9.4	9.2	9.5
	64	11.2	11.2	11.3



	np \ time(s)	blocking	rma	noblocking
grid size = 1200*300	2	991.542	962.931	987.986
	4	547.756	539.612	549.437
	8	344.838	346.727	345.201
	16	240.081	242.341	239.315
	32	185.228	190.71	185.438
	64	158.259	160.123	158.843

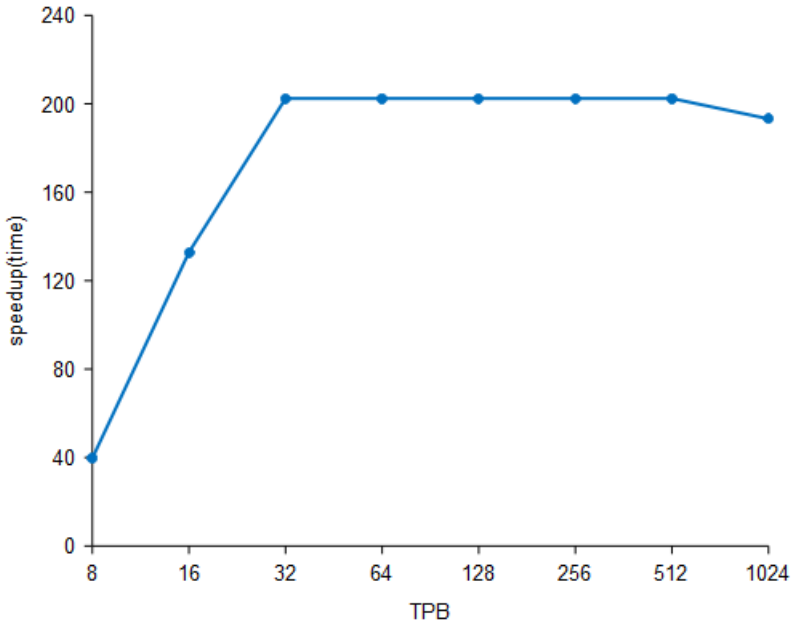
	np \ speedup(time)	blocking	rma	noblocking
grid size = 1200*300	2	1.8	1.8	1.8
	4	3.2	3.3	3.2
	8	5.1	5.1	5.1
	16	7.4	7.3	7.4
	32	9.6	9.3	9.6
	64	11.2	11.1	11.2



CUDA

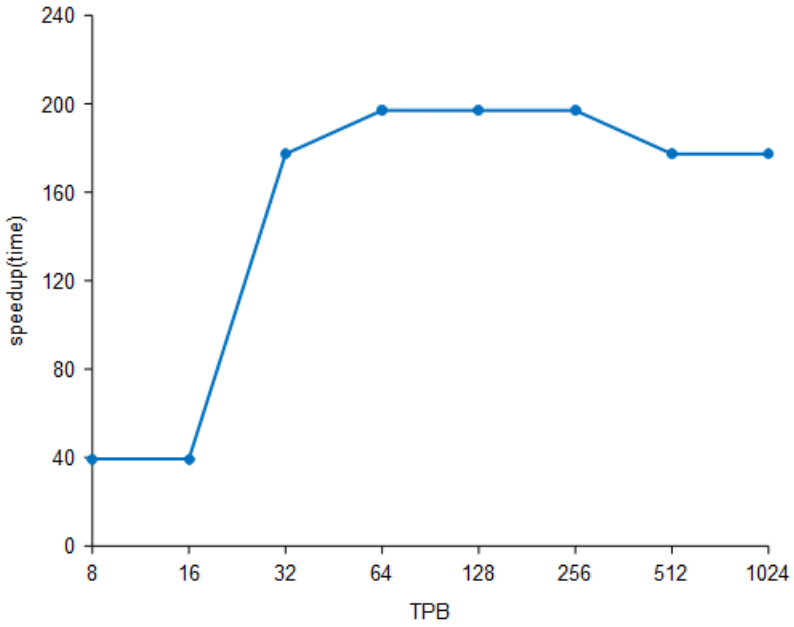
grid size = 1600*400	TPB	4	8	16	32	64	128	256	512	1024
	time(s)	107	107	32	21	21	21	21	21	22

grid size = 1600*400	TPB	4	8	16	32	64	128	256	512	1024
	speedup(time)	39.7	39.7	132.8	202.4	202.4	202.4	202.4	202.4	193.2



grid size = 1200*300	TPB	4	8	16	32	64	128	256	512	1024
	time(s)	45	45	45	10	9	9	9	10	10

grid size = 1200*300	TPB	4	8	16	32	64	128	256	512	1024
	speedup(time)	39.4	39.4	39.4	177.3	197	197	197	177.3	177.3



MPI blocking

Hardware of the test system

Table 1. Hardware of one node on kelvin01.

cluster	kelvin01
CPU Model	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz
CPU(s)	12
Thread(s) per core	1
Core(s) per socket	6
L1d cache	32K
L1i cache	32K
L2 cache	256K
L3 cache	12288K
Operating System	Scientific Linux release 7.8 (Nitrogen)

cluster	kelvin01
CPU Model	Intel(R) Xeon(R) CPU X5650 @ 2.67GHz
CPU(s)	12
Thread(s) per core	1
Core(s) per socket	6
L1d cache	32K
L1i cache	32K
L2 cache	256K
L3 cache	12288K
Operating System	Scientific Linux release 7.8 (Nitrogen)

Figure 3. Diagram of the blocking MPI code.