CPSC424 Assign4

Bo Song

Modules:

Base/yale_hpc

Langs/Intel/14

MPI/OpenMPI/1.6.5

Compile&link:

make

Run:

qsub run.sh

Key features:

Collective operations are used extensively.

Reduce operation is used to collect and sum body data in intermediate steps.

Task1 & 2

Data number	1	2	3	4
Serial	5.6060s	23.1325s	95.1826s	367.4772s
Parallel	1.6654s	6.7959s	37.4414s	137.8109s

Parallel program is 3 times faster than serial one.

Load balance

Cell: number of bodies in each octant

Data1

octant\#step	128	256	384	512	640	768	896
0	109	73	44	36	38	32	30
1	106	51	42	37	29	23	22
2	99	135	151	155	152	169	160
3	85	148	170	180	192	189	201
4	83	123	135	137	144	150	150
5	93	142	157	176	173	179	187
6	109	64	52	38	33	25	23
7	116	64	49	41	39	33	27

Data2

octant\#step	128	256	384	512	640	768	896
0	238	110	90	64	53	57	58
1	202	111	73	60	51	46	52
2	155	267	288	298	315	315	321
3	210	302	347	377	375	368	356
4	223	306	332	336	340	349	337
5	226	277	294	317	329	334	327

6	162	114	73	71	64	63	73
7	184	113	103	77	73	68	76

Data3

octant\#step	128	256	384	512	640	768	896
0	426	179	148	104	83	79	105
1	400	196	163	122	94	98	117
2	401	620	629	691	694	666	668
3	360	615	698	731	781	809	781
4	434	602	673	706	748	764	734
5	399	584	595	630	607	596	580
6	407	216	148	104	93	95	113
7	373	188	146	112	100	93	102

Data4

octant\#step	128	256	384	512	640	768	896
0	840	399	296	224	195	171	173
1	786	405	277	189	158	159	154
2	789	1220	1296	1362	1327	1296	1283
3	754	1163	1301	1386	1477	1532	1524
4	879	1218	1301	1337	1370	1373	1416
5	779	1168	1337	1450	1507	1531	1505
6	758	400	277	203	175	167	156
7	815	427	315	249	191	171	189

The program is balanced at the beginning while become less balance at the end, since the number of body in each octant is not evenly distributed.

Output:

Actualdata1_c.out
Initial Conditions (time = 0.0):

Center of Mass: (2.153875e-08, 1.148862e-09, 4.334575e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (-4.088525e-08, -2.401514e-08, 5.250070e-09)

Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (-1.033092e-07, -4.917914e-08, 6.165565e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (-1.657332e-07, -7.434314e-08, 7.081059e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (-2.281572e-07, -9.950714e-08, 7.996555e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (-2.905812e-07, -1.246711e-07, 8.912050e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (-3.530052e-07, -1.498351e-07, 9.827544e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (-4.154292e-07, -1.749991e-07, 1.074304e-08)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (-4.778533e-07, -2.001631e-07, 1.165854e-08)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)

Time for 1024 timesteps with 800 bodies: 5.6060 seconds

Actualdata2_c.out

Initial Conditions (time = 0.0):

Center of Mass: (-4.128126e-09, -1.835931e-10, -1.653466e-08)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (-6.843818e-09, -1.422610e-08, -5.569169e-09)
Average Velocity: (-6.789233e-10, -3.510628e-09, 2.741372e-09)

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (-9.559511e-09, -2.826861e-08, 5.396319e-09)
Average Velocity: (-6.789232e-10, -3.510628e-09, 2.741372e-09)

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (-1.227520e-08, -4.231112e-08, 1.636181e-08)
Average Velocity: (-6.789232e-10, -3.510627e-09, 2.741372e-09)

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (-1.499090e-08, -5.635363e-08, 2.732729e-08)
Average Velocity: (-6.789231e-10, -3.510628e-09, 2.741372e-09)

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (-1.770659e-08, -7.039614e-08, 3.829278e-08)
Average Velocity: (-6.789231e-10, -3.510628e-09, 2.741372e-09)

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (-2.042228e-08, -8.443865e-08, 4.925827e-08)

Average Velocity: (-6.789231e-10, -3.510628e-09, 2.741372e-09)

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (-2.313798e-08, -9.848116e-08, 6.022375e-08)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (-2.585367e-08, -1.125237e-07, 7.118924e-08)
Average Velocity: (-6.789231e-10, -3.510628e-09, 2.741372e-09)

Time for 1024 timesteps with 1600 bodies: 23.1325 seconds

Actualdata3_c.out

Initial Conditions (time = 0.0):

Center of Mass: (2.738437e-09, -8.980691e-09, -3.708599e-09)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (4.180687e-09, 6.828971e-08, 1.087360e-08)
Average Velocity: (3.605620e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (5.622937e-09, 1.455601e-07, 2.545580e-08)
Average Velocity: (3.605622e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (7.065187e-09, 2.228305e-07, 4.003800e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (8.507434e-09, 3.001009e-07, 5.462021e-08)
Average Velocity: (3.605622e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (9.949683e-09, 3.773713e-07, 6.920241e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (1.139193e-08, 4.546417e-07, 8.378461e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (1.283418e-08, 5.319121e-07, 9.836681e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (1.427643e-08, 6.091825e-07, 1.129490e-07)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Time for 1024 timesteps with 3200 bodies: 95.1826 seconds

Actualdata4_c.out

Initial Conditions (time = 0.0):

Center of Mass: (-2.018758e-08, 1.012155e-08, -3.957608e-09)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (-4.234837e-08, 2.443709e-08, 2.578647e-08)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (-6.450916e-08, 3.875264e-08, 5.553055e-08)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (-8.666995e-08, 5.306819e-08, 8.527463e-08)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (-1.088307e-07, 6.738374e-08, 1.150187e-07)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (-1.309915e-07, 8.169929e-08, 1.447628e-07)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (-1.531523e-07, 9.601483e-08, 1.745069e-07)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (-1.753131e-07, 1.103304e-07, 2.042509e-07)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (-1.974739e-07, 1.246459e-07, 2.339950e-07)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)

Time for 1024 timesteps with 6400 bodies: 367.4772 seconds

Actualdata1_c_parallel.out

Initial Conditions (time = 0.0):

Center of Mass: (2.153875e-08, 1.148863e-09, 4.334575e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288737e-10)
Load balance:800 0 0 0 0 0 0 0

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (-4.088525e-08, -2.401514e-08, 5.250070e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:109 106 99 85 83 93 109 116

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (-1.033092e-07, -4.917914e-08, 6.165565e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:73 51 135 148 123 142 64 64

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (-1.657333e-07, -7.434314e-08, 7.081061e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:44 42 151 170 135 157 52 49

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (-2.281573e-07, -9.950714e-08, 7.996556e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:36 37 155 180 137 176 38 41

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (-2.905812e-07, -1.246711e-07, 8.912052e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:38 29 152 192 144 173 33 39

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (-3.530052e-07, -1.498351e-07, 9.827547e-09)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:32 23 169 189 150 179 25 33

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (-4.154292e-07, -1.749991e-07, 1.074304e-08)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)
Load balance:30 22 160 201 150 187 23 27

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (-4.778532e-07, -2.001631e-07, 1.165854e-08)
Average Velocity: (-1.560600e-08, -6.291000e-09, 2.288738e-10)

Time for 1024 timesteps with 800 bodies: 1.6654 seconds

Actualdata2_c_parallel.out

Initial Conditions (time = 0.0):

Center of Mass: (-4.128124e-09, -1.835931e-10, -1.653466e-08)
Average Velocity: (-6.789229e-10, -3.510628e-09, 2.741372e-09)
Load balance:1600 0 0 0 0 0 0 0

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (-6.843818e-09, -1.422610e-08, -5.569169e-09)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)
Load balance:238 202 155 210 223 226 162 184

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (-9.559511e-09, -2.826861e-08, 5.396319e-09)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)
Load balance:110 111 267 302 306 277 114 113

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (-1.227520e-08, -4.231112e-08, 1.636181e-08)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)
Load balance:90 73 288 347 332 294 73 103

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (-1.499089e-08, -5.635363e-08, 2.732729e-08)
Average Velocity: (-6.789231e-10, -3.510628e-09, 2.741372e-09)
Load balance:64 60 298 377 336 317 71 77

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (-1.770659e-08, -7.039614e-08, 3.829278e-08)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)
Load balance:53 51 315 375 340 329 64 73

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (-2.042228e-08, -8.443865e-08, 4.925827e-08)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)
Load balance:57 46 315 368 349 334 63 68

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (-2.313797e-08, -9.848116e-08, 6.022376e-08)
Average Velocity: (-6.789231e-10, -3.510628e-09, 2.741372e-09)
Load balance:58 52 321 356 337 327 73 76

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (-2.585367e-08, -1.125237e-07, 7.118925e-08)
Average Velocity: (-6.789231e-10, -3.510627e-09, 2.741372e-09)

Time for 1024 timesteps with 1600 bodies: 6.7959 seconds

Actualdata3_c_parallel.out

Initial Conditions (time = 0.0):

Center of Mass: (2.738440e-09, -8.980691e-09, -3.708599e-09)
Average Velocity: (3.605630e-10, 1.931760e-08, 3.645550e-09)
Load balance:3200 0 0 0 0 0 0 0

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (4.180686e-09, 6.828971e-08, 1.087360e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)
Load balance:426 400 401 360 434 399 407 373

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (5.622936e-09, 1.455601e-07, 2.545580e-08)
Average Velocity: (3.605621e-10, 1.931760e-08, 3.645550e-09)
Load balance:179 196 620 615 602 584 216 188

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (7.065185e-09, 2.228305e-07, 4.003800e-08)
Average Velocity: (3.605622e-10, 1.931760e-08, 3.645550e-09)
Load balance:148 163 629 698 673 595 148 146

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (8.507433e-09, 3.001009e-07, 5.462021e-08)
Average Velocity: (3.605624e-10, 1.931760e-08, 3.645550e-09)
Load balance:104 122 691 731 706 630 104 112

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (9.949682e-09, 3.773713e-07, 6.920241e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)
Load balance:83 94 694 781 748 607 93 100

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (1.139193e-08, 4.546417e-07, 8.378461e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)
Load balance:79 98 666 809 764 596 95 93

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (1.283418e-08, 5.319121e-07, 9.836681e-08)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)
Load balance:105 117 668 781 734 580 113 102

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (1.427643e-08, 6.091825e-07, 1.129490e-07)
Average Velocity: (3.605623e-10, 1.931760e-08, 3.645550e-09)

Time for 1024 timesteps with 3200 bodies: 37.4414 seconds

Actualdata4_c_parallel.out

Initial Conditions (time = 0.0):

Center of Mass: (-2.018758e-08, 1.012155e-08, -3.957608e-09)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)
Load balance:6400 0 0 0 0 0 0 0

Conditions after timestep 128 (time = 4.000000):

Center of Mass: (-4.234837e-08, 2.443709e-08, 2.578647e-08)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)
Load balance:840 786 789 754 879 779 758 815

Conditions after timestep 256 (time = 8.000000):

Center of Mass: (-6.450916e-08, 3.875264e-08, 5.553055e-08)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)
Load balance:399 405 1220 1163 1218 1168 400 427

Conditions after timestep 384 (time = 12.000000):

Center of Mass: (-8.666995e-08, 5.306819e-08, 8.527463e-08)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)
Load balance:296 277 1296 1301 1301 1337 277 315

Conditions after timestep 512 (time = 16.000000):

Center of Mass: (-1.088307e-07, 6.738374e-08, 1.150187e-07)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)
Load balance:224 189 1362 1386 1337 1450 203 249

Conditions after timestep 640 (time = 20.000000):

Center of Mass: (-1.309915e-07, 8.169928e-08, 1.447628e-07)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)
Load balance:195 158 1327 1477 1370 1507 175 191

Conditions after timestep 768 (time = 24.000000):

Center of Mass: (-1.531523e-07, 9.601484e-08, 1.745069e-07)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)
Load balance:171 159 1296 1532 1373 1531 167 171

Conditions after timestep 896 (time = 28.000000):

Center of Mass: (-1.753131e-07, 1.103304e-07, 2.042509e-07)
Average Velocity: (-5.540198e-09, 3.578887e-09, 7.436020e-09)
Load balance:173 154 1283 1524 1416 1505 156 189

Conditions after timestep 1024 (time = 32.000000):

Center of Mass: (-1.974739e-07, 1.246459e-07, 2.339950e-07)
Average Velocity: (-5.540197e-09, 3.578887e-09, 7.436020e-09)

Time for 1024 timesteps with 6400 bodies: 137.8109 seconds

Env:
MKLROOT=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl
MANPATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel/share/man:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/man/en_US:/usr/share/man:/opt/moab/share/man:
MKL_LINK=-L/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/lib/intel64 -Wl,--start-group -lmkl_intel_lp64 -lmkl_intel_thread -lmkl_core -Wl,--end-group -lpthread -lm
HOSTNAME=compute-14-1.local
IPPROOT=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp
INTEL_LICENSE_FILE=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/licenses:/opt/intel/licenses:/home/apps/fas/Licenses/intel_site.lic
TERM=xterm
SHELL=/bin/bash
HISTSIZE=1000
SSH_CLIENT=10.191.63.253 45156 22
LIBRARY_PATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel/lib:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp/../compiler/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/compiler/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/tbb/lib/intel64/gcc4.4
PERL5LIB=/opt/moab/lib/perl5
FPATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel/include:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/include:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/include/intel64/lp64
QTDIR=/usr/lib64/qt-3.3
OLDPWD=/home/fas/cpsc424/bs744/cs424
QTINC=/usr/lib64/qt-3.3/include
MIC_LD_LIBRARY_PATH=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mpirt/lib/mic:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/compiler/lib/mic:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/lib/mic:/opt/intel/mic/coi/device-linux-release/lib:/opt/intel/mic/myo/lib:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/tbb/lib/mic
SSH_TTY=/dev/pts/1
ANT_HOME=/opt/rocks
USER=bs744
LD_LIBRARY_PATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel/lib:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mpirt/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp/../compiler/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp/lib/intel64:/opt/intel/mic/coi/host-linux-release/lib:/opt/intel/mic/myo/lib:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/compiler/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/lib/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_x

e_2013_sp1.2.144/tbb/lib/intel64/gcc4.4
MIC_LIBRARY_PATH=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/tbb/lib/mic
ROCKS_ROOT=/opt/rocks
CPATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel/include:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp/include:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/include:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/tbb/include
YHPC_COMPILER=Intel
OMPI_MCA_orte_precondition_transports=f20cd2d28f432704-15e3f8c3bb8e89d6
NLSPATH=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/compiler/lib/intel64/locale/%l_%t/%N:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/ipp/lib/intel64/locale/%l_%t/%N:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/lib/intel64/locale/%l_%t/%N:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/gdb/intel64_mic/py26/share/locale/%l_%t/%N:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/gdb/intel64/py26/share/locale/%l_%t/%N:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/intel64/locale/%l_%t/%N
MAIL=/var/spool/mail/bs744
PATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel/bin:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mpirt/bin/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/gdb/intel64_mic/py26/bin:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/gdb/intel64/py26/bin:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/bin/intel64:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/bin/intel64_mic:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/gui/intel64:/home/apps/fas/Modules:/usr/lib64/qt-3.3/bin:/opt/moab/bin:/usr/local/bin:/bin:/usr/bin:/usr/local/sbin:/usr/sbin:/sbin:/usr/java/latest/bin:/opt/rocks/bin:/opt/rocks/sbin:/home/apps/bin:/home/fas/cpsc424/bs744/bin
YHPC_COMPILER_MINOR=2
TBBROOT=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/tbb
F90=ifort
PWD=/home/fas/cpsc424/bs744/cs424/BoSong_PS4_CPSC424
LMFILES=/home/apps/fas/Modules/Base/yale_hpc:/home/apps/fas/Modules/Langs/Intel/14:/home/apps/fas/Modules/MPI/OpenMPI/1.6.5
YHPC_COMPILER_MAJOR=0
JAVA_HOME=/usr/java/latest
IDB_HOME=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/bin/intel64
GDB_CROSS=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/debugger/gdb/intel64_mic/py26/bin/gdb-mic
DOMAIN=omega
LANG=en_US.iso885915
MODULEPATH=/home/apps/fas/Modules

MOABHOMEDIR=/opt/moab
YHPC_COMPILER_RELEASE=14
LOADEDMODULES=Base/yale_hpc:Langs/Intel/14:MPI/OpenMPI/1.6.5
KDEDIRS=/usr
F77=ifort
CXX=icpc
SSH_ASKPASS=/usr/libexec/openssh/gnome-ssh-askpass
HISTCONTROL=ignoredups
SHLVL=1
HOME=/home/fas/cpsc424/bs744
MKL_LINK_SEQUENTIAL=-L/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/lib/intel64 -Wl,--start-group -lmkl_intel_lp64 -lmkl_sequential -lmkl_core -Wl,--end-group -lpthread
FC=ifort
LOGNAME=bs744
QTLIB=/usr/lib64/qt-3.3/lib
CVS_RSH=ssh
SSH_CONNECTION=10.191.63.253 45156 10.191.10.209 22
MODULESHOME=/usr/share/Modules
LESSOPEN=||/usr/bin/lesspipe.sh %s
arch=intel64
CC=icc
DISPLAY=localhost:10.0
INCLUDE=/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/include:/home/apps/fas/Langs/Intel/icsxe/2013.1.046/composer_xe_2013_sp1.2.144/mkl/include/intel64/lp64
MPI_PATH=/home/apps/fas/MPI/OpenMPI/1.6.5-intel
G_BROKEN_FILENAMES=1
BASH_FUNC_module()=() { eval `/usr/bin/modulecmd bash $*`
}
_=/bin/env