

# Using Allinea's MAP Profiler - an example of Sweep3d

**Using MAP is mandatory in the final projects!**

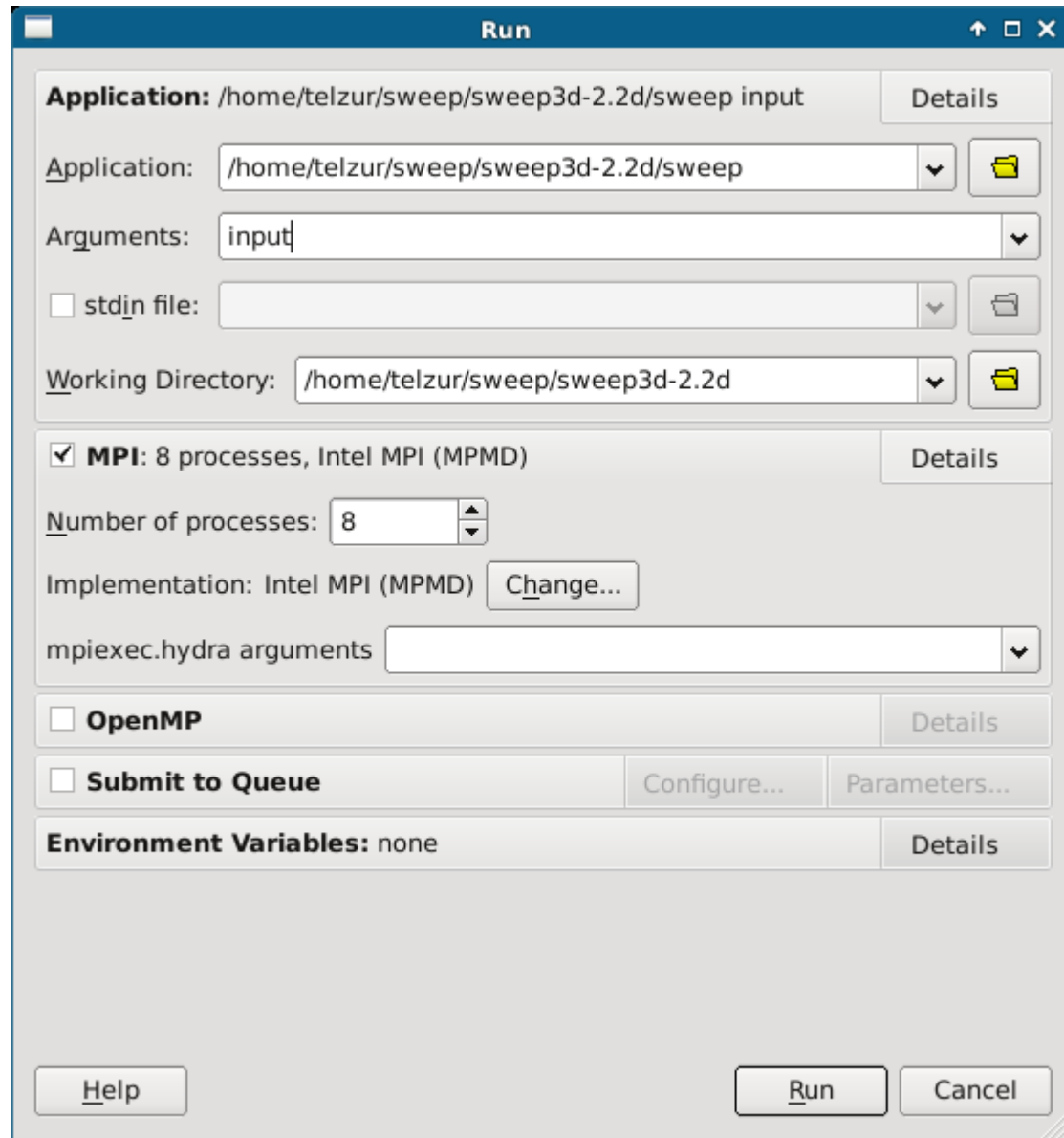
Guy Tel-Zur

# References

- Allinea DDT and MAP User Guide,  
<http://content.allinea.com/downloads/userguide.pdf>
- Profiling and Optimizing for Xeon Phi with Allinea MAP,  
[http://data1.gfdl.noaa.gov/multi-core/2013/presentations/paisley\\_3b.pdf](http://data1.gfdl.noaa.gov/multi-core/2013/presentations/paisley_3b.pdf)

# Profiling with MAP

- Our license is limited to max 12 threads



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/home/telzur/sweep/sweep3d-2.2d/sweep

8 processes

194 samples

Started on Thu May 22 11:23:15 2014

Runtime: 6s

Stopped on Thu May 22 11:23:21 2014

Collection time: 2s

Output For Process:

All



```

Other:  its =          3  err =  166.916352976391      fixs =          0
Other:  its =          4  err =  529.873737150374      fixs =          0
Other:  its =          5  err =  124.600760647219      fixs =          0
Other:  its =          6  err =  265.499955311998      fixs =          0
Other:  its =          7  err =  21.9709341471838      fixs =          0
Other:  its =          8  err =  14.4168856153294      fixs =          0
mpiexec.hydra:  its =          9  err =   7.66919152009635      fixs =          0
mpiexec.hydra:  its =         10  err =  27.6237451669830      fixs =          0
mpiexec.hydra:  its =         11  err =   4.52050231544498      fixs =          0
mpiexec.hydra:  its =         12  err =   2.79119302251601      fixs =          0
mpiexec.hydra:  Balance quantities:
mpiexec.hydra:  External Source:   3.21600000000000
mpiexec.hydra:  Absorption:         1.33825048636375
mpiexec.hydra:  I-leakages:        -0.247834893513047    0.247834893513047
mpiexec.hydra:  J-leakages:        -0.691039749016145    0.691039749016145
mpiexec.hydra:  K-leakages:        7.383816628157963E-010 -7.383816628157946E-010
mpiexec.hydra:  CPU    time was:    2.04169000000000
mpiexec.hydra:  Elapsed time was:  2.10661196708679
mpiexec.hydra:  CPU grind time:   4.431E-02
mpiexec.hydra:  Wall grind time:  4.572E-02

```

Note: Allinea MAP can only send input to the mpiexec.hydra process with this MPI implementation

Type here ('Enter' to send):

More



**Connecting to sweep**

mpiexec.hydra ready

Processes connected: 0/8

Processes ready: 0/8

Cancel

Output >>

File View Search Window Help

Profiled: sweep on 8 processes Started: Thu May 22 11:23:15 2014 Runtime: 2s Time in MPI: 86%

Hide Metrics...

**Memory usage (M)**

6.6 - 16.8 (12.9 avg)

**MPI call duration (ms)**

0 - 280.7 (10.8 avg)

**CPU floating-point (%)**

0 - 100 (6 avg)

11:23:16 (+1.578s, 75.8%): Memory usage ranged from **10.5 M** (rank 3) to **16.5 M** (rank 5) with mean **13.2 M** and s.d. **2.4 M**

Metrics

Reset

inner.f ×

```

94         nfixed = 0
95         if (ifixups.gt.0) then ...f
103
86.8% 104         call sweep (it,jt, kt, nm, isct, mm,mmo,mmi, mk, myid,
105         1 hi, hj, hk, di, dj, dk, Phi, Phii,
106         2 Src, Flux, Sigt,
107         3 w,mu,eta,tsi, wmu,weta,wtsi, pn,
108         4 north south east west

```

Input/Output

Project Files

Parallel Stack View

Parallel Stack View

Time	MPI	Function(s) on line	Source	Position
		driver	program driver	driver.f:1
		inner_auto	call inner_auto (it, jt, kt, nm, isc...	driver.f:174
		inner	call inner (it, jt, kt, nm, isct, mm...	inner_auto.f:54
		sweep	call sweep (it,jt, kt, nm, isct, mm,...	inner.f:104
38.2%	38.0%	rcv_real	call rcv_real(ew_rcv, phiib, nib, ew...	sweep.f:237
13.1%	13.1%	snd_real	call snd_real(ns_snd, phiib, njb, ns...	sweep.f:550
12.0%	12.0%	rcv_real	call rcv_real(ns_rcv, phiib, njb, ns...	sweep.f:280
9.9%	9.9%	snd_real	call snd_real(ew_snd, phiib, nib, ew...	sweep.f:513
2.6%			phi(i) = ql * dl	sweep.f:404
1.2%			phiir = 2.0d+0*phi(i) - phiir	sweep.f:406
1.0%			ql = ( phi(i) +	sweep.f:402
8.8%		41 others		

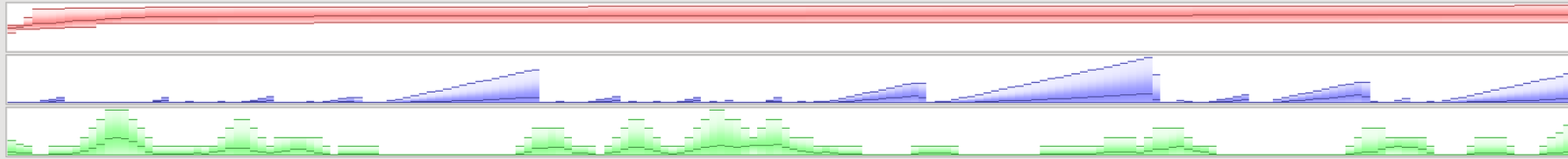
Profiled: sweep on 8 processes Started: Thu May 22 11:23:15 2014 Runtime: 2s Time in MPI: 86%

Hide Metrics...

**Memory usage (M)**  
6.6 - 16.8 (12.9 avg)

**MPI call duration (ms)**  
0 - 280.7 (10.8 avg)

**CPU floating-point (%)**  
0 - 100 (6 avg)



11:23:15-11:23:17 (2.086s): Mean: Memory usage **12.9 M**; MPI call duration **10.8 ms**; CPU floating-point **6.4 %**;

Metrics, Reset

f inner.f x f msg\_stuff.f x f sweep.f x

```

229 ! this could be *nk* instead of *mk* if all phi(i,j){b,bc}
230 ! were dimensioned with mmi as the second dimension
231 nib = jt*mk*mmi
232 njb = it*mk*mmi
233
234 c I-inflows for block (i=i0 boundary)
235 c
236 if (ew_rcv .ne. 0) then
237   call rcv_real(ew_rcv, phiib, nib, ew_tag, info)
238 else
239   if (i2.lt.0 .or. ibc.eq.0) then ...f
240 endif
241 if (do_dsa) then
242   i = i0 - i2
243   do mi = 1, mmi
244     m = mi + mio
245     do lk = 1, nk
246       k = k0 + sign(lk-1,k2)
247     enddo
248   enddo

```



Input/Output Project Files Parallel Stack View

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		inner	call inner (it, jt, kt, nm, isct, mm,mmo,mmi, mk,	inner_auto.f:54
		sweep	call sweep (it,jt, kt, nm, isct, mm,mmo,mmi, mk, myid,	inner.f:104
38.2%	38.0%	rcv_real	call rcv_real(ew_rcv, phiib, nib, ew_tag, info)	sweep.f:237
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9.9%	9.9%	snd_real	call snd_real(ew_snd, phiib, nib, ew_tag, info)	sweep.f:513
2.6%			phi(i) = ql * dl	sweep.f:404
1.2%			phiir = 2.0d+0*phi(i) - phiir	sweep.f:406
1.0%			ql = ( phi(i) +	sweep.f:402
8.8%		41 others		
12.9%	12.9%	global_int_sum	call global_int_sum(nfixed)	inner.f:116
0.1%		1 other		
0.2%	0.2%	1 other		