

Towards performance benchmarks for VT26 on Virgo

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Example output on VIRGO – Event-based for 1 thread

Unpacking

```
CommonUnpacker.TRD
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  CommonUnpacker.TRD.Sort: 1491.244 ms ( 0.209 GB/s)
  CommonUnpacker.TRD.Merge: 89.676 ms ( 3.474 GB/s)
  CommonUnpacker.TRD.Resize: 0.024 ms
  Unpack: 1103.011 ms ( 0.282 GB/s)
  Wall time: 2685.010 ms ( 0.116 GB/s)
CommonUnpacker.TOF
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  CommonUnpacker.TOF.Sort: 1004.113 ms ( 0.432 GB/s)
  CommonUnpacker.TOF.Merge: 127.175 ms ( 3.410 GB/s)
  CommonUnpacker.TOF.Resize: 0.024 ms
  Unpack: 1029.382 ms ( 0.351 GB/s)
  Wall time: 2204.157 ms ( 0.164 GB/s)
CommonUnpacker.RICH
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  CommonUnpacker.RICH.Sort: 93.506 ms ( 0.509 GB/s)
  CommonUnpacker.RICH.Merge: 16.937 ms ( 2.809 GB/s)
  CommonUnpacker.RICH.Resize: 0.021 ms
  Unpack: 118.382 ms ( 0.335 GB/s)
  Wall time: 233.789 ms ( 0.170 GB/s)
CommonUnpacker.MUCH
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  CommonUnpacker.MUCH.Sort: 0.001 ms
  CommonUnpacker.MUCH.Merge: 0.001 ms
  CommonUnpacker.MUCH.Resize: 0.000 ms
  Unpack: 0.006 ms
  Wall time: 0.030 ms
CommonUnpacker.STS
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  CommonUnpacker.STS.Sort: 1022.004 ms ( 0.257 GB/s)
  CommonUnpacker.STS.Merge: 90.142 ms ( 2.914 GB/s)
  CommonUnpacker.STS.Resize: 0.035 ms
  Unpack: 1768.309 ms ( 0.149 GB/s)
  Wall time: 2881.313 ms ( 0.091 GB/s)
CommonUnpacker.BMON
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  CommonUnpacker.BMON.Sort: 20.994 ms ( 0.561 GB/s)
  CommonUnpacker.BMON.Merge: 5.755 ms ( 2.048 GB/s)
  CommonUnpacker.BMON.Resize: 0.014 ms
  Unpack: 47.641 ms ( 0.165 GB/s)
  Wall time: 74.520 ms ( 0.105 GB/s)
Wall time: 8457.816 ms ( 0.121 GB/s)
```

Trigger and EventReco

```
TimeClusterTrigger
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  Wall time: 19.745 ms ( 7.321 GB/s)
EventBuilder
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  Wall time: 2140.049 ms ( 0.499 GB/s)
Reco.EventReco
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  tof::Hitfind.FindHit: 5608.226 ms ( 0.049 GB/s)
  tof::Hitfind.ChanSort: 296.692 ms
  tof::Calibrate: 2482.180 ms ( 0.117 GB/s)
  TrackingChain.CA: 54136.708 ms ( 0.020 GB/s)
  sts::HitfinderChainCpu.SortHits: 418.316 ms
  sts::HitfinderChainCpu.FlattenDigis: 220.883 ms ( 1.349 GB/s)
  sts::HitfinderChainCpu.FlattenHits: 6928.527 ms ( 0.109 GB/s)
  sts::HitfinderChainCpu.Allocate: 46636.233 ms
  sts::HitfinderChainCpu.CountDigisByModule: 642.714 ms ( 0.464 GB/s)
  Wall time: 129735.961 ms
Total
  Memcpy(h2d): 0.000 ms
  Memcpy(d2h): 0.000 ms
  Memset: 0.000 ms
  Kernel time: 0.000 ms
  Wall time: 140507.412 ms ( 0.007 GB/s)
```

Setup according to Wiki

Input: /lustre/cbm/users/friese/vt26_test/vtfeed/data/vt26.00000.tsa

Allocation of 1 node (ccwks0003)

JOBID	PARTITION	NAME	USER	ST	TIME	NODES	NODELIST(REASON)
16778909	work	interact	aredeib	R	33:21	1	ccwks0003

Results for CPU scaling on VIRGO – Event-based

- Recent Cbmroot, including „tracking search window“
- Setup from /lustre/cbm/users/szharko/vt/vt26/pars_vt26/
- Large contributions from Sts.HitFinderChainCpu.Allocate!

Reco steps:

Unpack
DigiTrigger
EventReco
KfpSelector

Not visible
in timing info

Num. of OpenMP threads	Unpack wall time (in ms)	StsAllocate runtime (in ms)	CA runtime (in ms)	Total wall time (in ms), rate
1	8457	46636	54136	140507 (0.007 GB/s)
2	6862	25931	27663	77661 (0.013 GB/s)
4	6060	13295	13696	43658 (0.023 GB/s)
8	5658	6955	6982	26007 (0.039 GB/s)
16	5551	3989	3523	17955 (0.057 GB/s)
32	5524	3168	1618	14577 (0.070 GB/s)
64	5591	2957	1944	14406 (0.071 GB/s)
128	5552	4213	1446	16125 (0.063 GB/s)
256	5550	6663	649	18193 (0.056 GB/s)

Time for
Unpacking
dominates for
#threads ≥ 16