Grand Challenge MDC1 Plans

Doug Olson
Nuclear Science Division, Berkeley Lab
for the HENP-GC Collaboration

RCF Meeting

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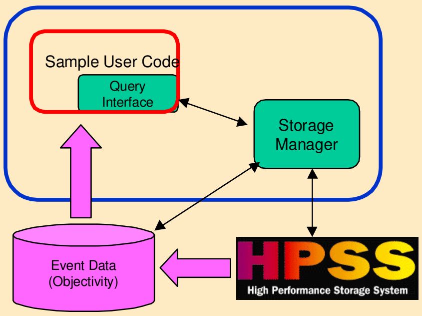
Outline

- Overview of MDC1 setup
- Status of pieces
- Measurements & tests

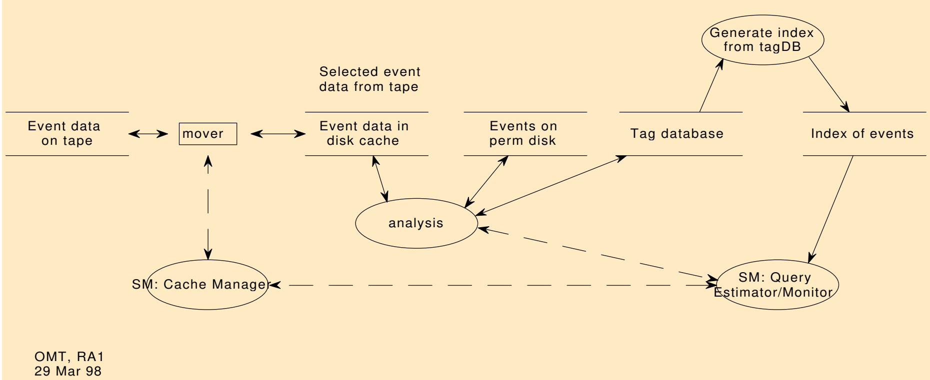
Overview of MDC1 setup



- Rmds03
- User code
  - blind (ooId)
  - plain (StOdbEvent, StTrack, no analysis code)
  - STAF-GC-BaBar (STAR post-dst analysis code)
    - QO, OOI
- Storage manager
  - qe
  - qmonitor
  - cmanager
- STAR dst data
  - loaded into Objy from xdf

Machinery to query tagDB & retrieve objects (in files) from HPSS (via pftp).

Data flow,
including build GC index



MDC1 components

- Code
  - storage manager pieces OK
    - qe, qmonitor, cmanager
  - client-side code OK
    - QO, OOI
  - integration in STAF with STAR, BaBar, Objy
    - in testing
- Objectivity federated database
  - STAR FD loaded from dst xdf files, 8GB now (9/24/98 AM), 40GB available (9/24/98 PM)

MDC1 components (cont.)

- Environment
  - code in /afs/rhic/gc/cvs
  - binaries in /grandch/u/GCA/bin
- Test setup
  - scripts to run sets of queries
  - log files produced by components
  - analysis of logs
- Measurement plans
  http://www-rnc.lbl.gov/GC/mail/archive/msg000257.htm

Example log file & SM analysis

```
[rsun00] ~/STARdb > cat cm*
                              CMLogFile
          Date              Clock      DBID   File Size    Time
                            (sec)               (MB)       (sec)
------------------------------------------------------------------------------
Wed Sep 23 18:45:28 1998         19         53       49          17
Wed Sep 23 18:45:30 1998         21         47       97          27
Wed Sep 23 18:45:51 1998         42         40       80          18
Wed Sep 23 18:46:00 1998         51         43      109          23
Wed Sep 23 18:46:13 1998         64         54       91          32
Wed Sep 23 18:46:26 1998         77         59       59          19
Wed Sep 23 18:46:47 1998         98         61       38           9
```

Acrobat Document

Example SGB kumac

```
macro runtest

* bind & init GCA & STAR-Event-Store ASPs
soc/bind gca
gca/initialize /grandch/u/GCA/tmp/gc.config
soc/bind ses
kuip/alias/create make 'exec mgr/make' c

* --> make & load PAM to translate Obj-to-Tables
make objy

*--> begin query of GCA index
gca/newquery qtest mean_pt<0.2
query/fullest qtest

*--> execute query for file retrieval
query/execute qtest

*--> build OOI contact with SM
newooi ooitest qtest

*
```

```
alias/del TOP
macro/global/create TOP /star/sol/db/StafObjy
exec $STAR/kumacs/util/setup_defaults
exec setup#setup
exec init_dst#create_table

WHILE TRUE

*--> get an event into Star-Event-Store ASP
ooi/getevent ooirjp

*--> read Objy-Event and translate to tables
exec /star/sol/db/StafObjy/EvRead#read
IF(STAF_STATUS(1) .ne. STAFCV_OK) then
   return
ENDIF

*--> standard STAR analysis kumae
   exec analyze_dst

ENDDO

*--> cleanup
deleteooi  ooitest
deletequery qtest

return
```

Load Objectivity

dstfind

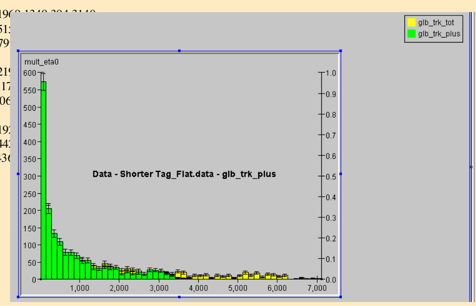
stafobjy newdst2db.kumac

oodumpcatalog /rmds03::/disk0/grandch/stardb/fd30025/STAR

```
Objectivity/DB (TM) List Database Files Utility, Version 5.0 Build:  58
Copyright (c) Objectivity, Inc 1990, 1998. All rights reserved.

FD Name   = STAR
FD ID     = 30025
FD File   = rmds03.rhic.bnl.gov::/disk0/grandch/stardb/fd30025/STAR.FDDB
Boot File = rmds03.rhic.bnl.gov::/disk0/grandch/stardb/fd30025/STAR
Jnl Dir   = rmds03.rhic.bnl.gov::/disk0/grandch/stardb/fd30025
Lock Host = rsun00.rhic.bnl.gov

DB Name   = management
DB ID     = 2
DB Image  = rmds03.rhic.bnl.gov::/disk0/grandch/stardb/fd30025/management.STAR.DB

... deleted lines ...

DB Name   = dst/psc083_02_46evts_dst.xdf
DB ID     = 151
DB Image  = rmds03.rhic.bnl.gov::/disk0/grandch/stardb/fd30025/dst/psc083_02_46evts_dst.xdf.STAR.DB
```


Build Index & analyze tags

```
[rmds03] /disk0/grandch/stardb/Index > more Tag_Flat_Index.data
 n_event0 n_event1 prod_run glb_trk_tot glb_trk_good glb_trk_prim glb_trk_plus g
lb_trk_minus n_vert_total n_vert_V0 n_vert_K0 n_vert_Lambda n_vert_ALambda n_ver
t_pileup mult_eta0 mult_eta1 mult_eta2 mult_eta3 mult_eta4 mult_pt0 mult_pt1 mul
t_pt2 mult_pt3 mult_pt4 mult_phi0 mult_phi1 mult_phi2 mult_phi3 mult_phi4 mean_p
t mean_eta T_average T_eta_bins0 T_eta_bins1 T_eta_bins2 energy_emc_eta0 energy_
emc_eta1 energy_emc_eta2 energy_emc_eta3 energy_emc_eta4 energy_emc_phi0 energy
_emc_phi1 energy_emc_phi2 energy_emc_phi3 energy_emc_phi4 prim_vrtx0 prim_vrtx1
prim_vrtx2 prim_vrtx_chisq nTags EventID.dbaseID EventID.contID EventID.pageID
EventID.slotID Set file_ID
 0 0 0 5845 5388 0 3114 2731 50206 50205 50205 0 0 0 393 1283
 1433 459 186 77 147 131 651 1094 1029 0.391864 0.012653
942 0.179345 0 0 0 0 0 0 0 0 0 0 -0.00075826 0.00654174
77 3
 0 0 0 6201 5702 0 3279 2922 54783 54782 54782 0 0 0 433 1311
 1486 508 184 83 151 125 650 1114 1099 0.396015 -0.00380799
169312 0.180685 0 0 0 0 0 0 0 0 0 0 -0.00260277 -0.00826739
 3 31 77 3
 0 0 0 5533 5143 0 2905 2628 42734 42733 42733 0 0 0 383 1180
 1300 443 172 75 141 118 581 1030 1056 0.373894 0.010245
508 0.193284 0 0 0 0 0 0 0 0 0 0 0.00633065 -0.00975605
7 77 3
```



Query test script

```
[rmds03] /grandch/u/GCA/bin > more sii.sh
#!/usr/local/bin/perl -w

print "enter the file with queries : ";
$QFILE=<STDIN>;
chop($QFILE);

open(FILE, $QFILE);

foreach (<FILE>) {
        push(@Q, $_);
}
@Q[0,1,2,3] = @Q[3,2,0,1];
$CYCLE = 2;

for ($i=0; $i < $CYCLE; $i++) {
        foreach $j (@Q) {
                @field = split(/:/, $j);
                $QUERY = "./sii.sol -q $field[0] -t $field[1]";
                print $QUERY;
                system("xterm -title SII -sb -sl 3000 -e $QUERY &");
                sleep($field[2]);
        }
}
```

```
[rmds03] /grandch/u/GCA/bin > more sii.queries
"(4<N_Ev<6)&10.<SumofMomentum_x<12." : 1 : 3
"14.<SumofMomentum_x<15." : 2 : 4
"600<num_Pion_p<610" : 1 : 3
"4.9<tot_trans_Mass<10." : 2 : 5
"105<num_Pion_n<107" : 3 : 2
```


Measurements & tests

- “typical queries” (have some STAR E-by-E)
- compare w/ & w/o GCA
  (?, may be able to serialize in policy module)
- measure wall clock, CPU time, storage cacheing time
- multiple simultaneous queries
- time-staggered queries
- disk cache size

MDC1 schedule

- Preparations & tests of scripts now (phase 1)
- Measurements in GC/data mining phase 2
- Resource requirements
  - exclusive use of one tape drive
  - purge hpss disk cache on demand
  - <= 50 GB disk
  - exclusive use of 2 tape drives (last test)

Who - the workers

- Dave Malon, ATLAS/ANL
- Henrik Nordberg, NERSC/LBNL
- Luis Bernardo, NERSC/LBNL
- Alex Sim, NERSC/LBNL
- Dave Stampf, RCF/BNL
- Jeff Porter, STAR/LBNL
- Dave Zimmerman, STAR/LBNL
- Jie Yang, STAR/LBNL-UCLA-Beijing
- Mark Pollack, PHENIX/BNL

Who - the others

- Doug Olson - STAR/LBNL
  Arie Shoshani, Doron Rotem - NERSC/LBNL (Data Mgmt Grp)
  Craig Tull - NERSC/LBNL (HENP)
- Bruce Gibbard, Shigeki Misawa RCF/BNL
  Torre Wenaus STAR/BNL
- ED May - ATLAS/ANL
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