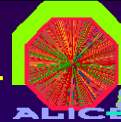


Interface with DAQ-ECS databases

Sylvain Chapeland
Alice DAQ group

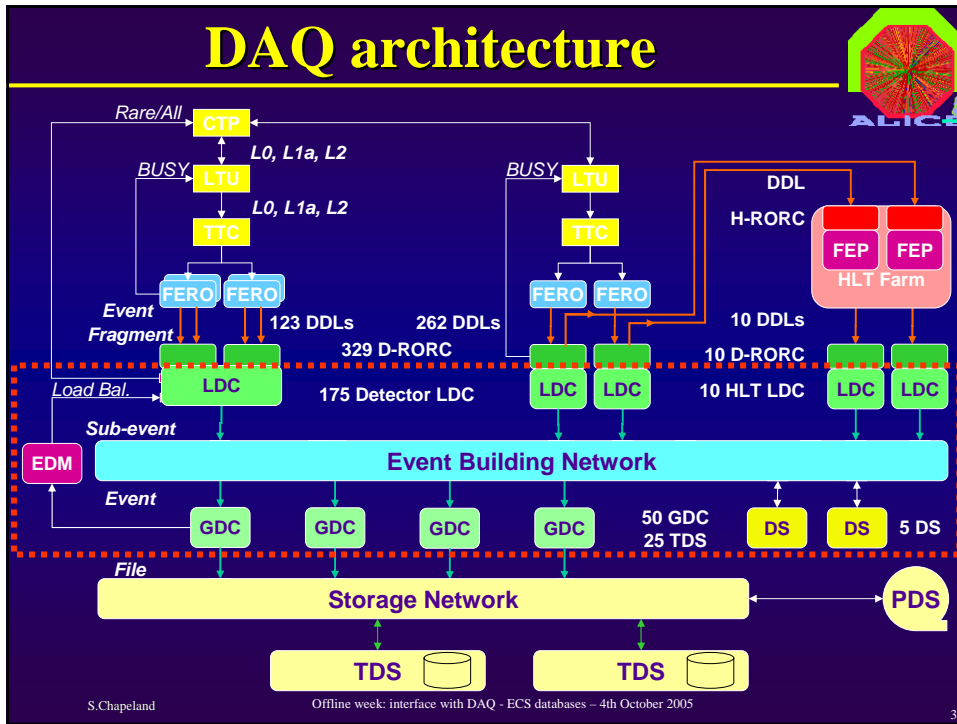
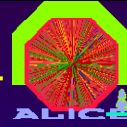
Offline week – 4th october 2005

Overview

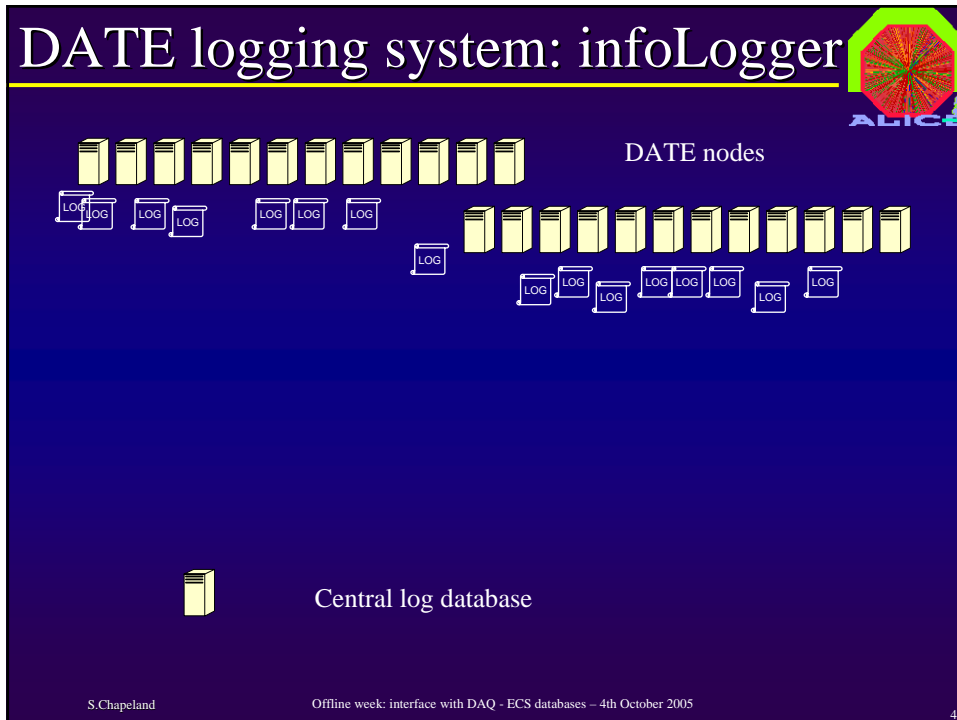
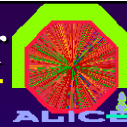


- DAQ logbook
- MySQL interface
- Content of the database

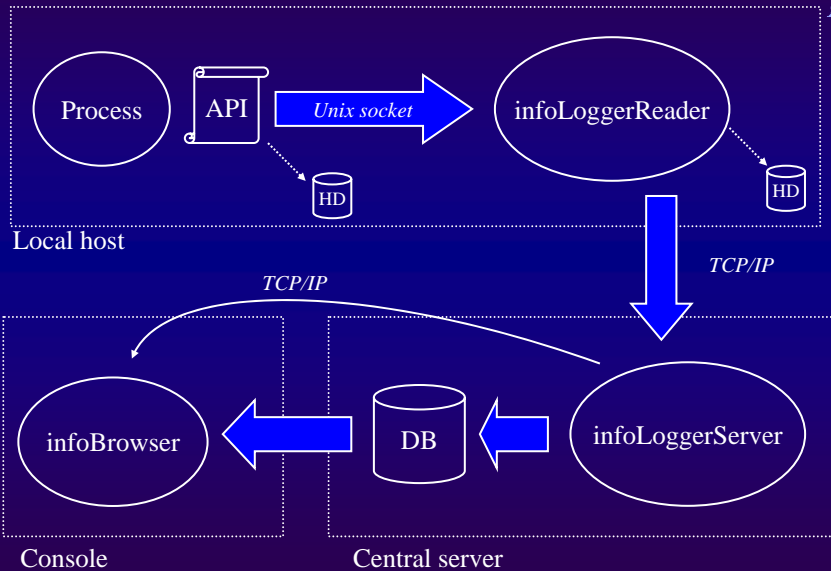
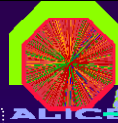
DAQ architecture



DATE logging system: infoLogger



DATE v5 infoLogger architecture

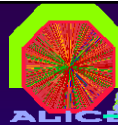


S.Chapeland

Offline week: interface with DAQ - ECS databases - 4th October 2005

5

Information recorded



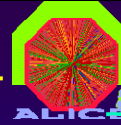
- For each log message:
 - Text message
 - Severity (Fatal, Error, Info)
 - Timestamp (microsecond resolution)
 - Hostname
 - PID
 - Username
 - Facility (DATE task)
 - Destination (log stream)
 - Run number (when available)
- Stored in a MySQL database

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Offline week: interface with DAQ - ECS databases - 4th October 2005

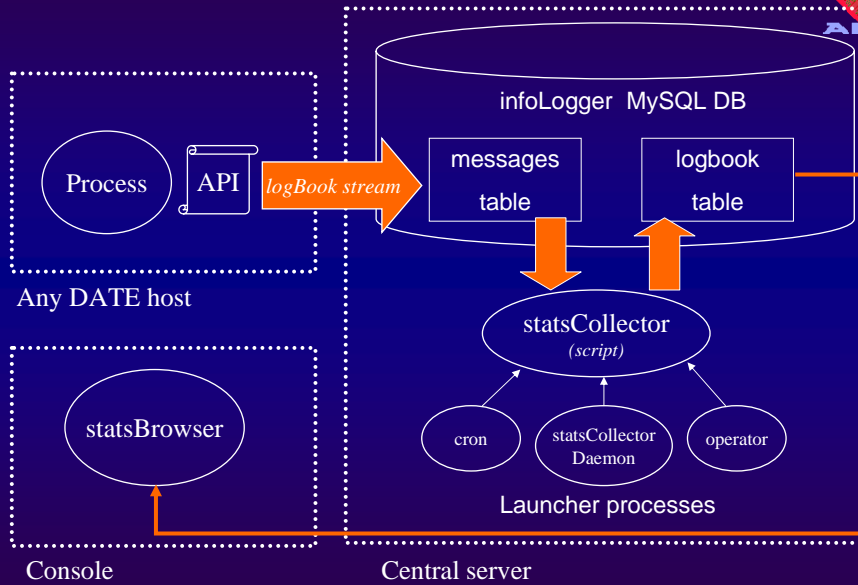
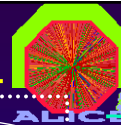
6

Logbook

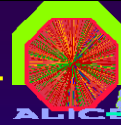


- Relies on messages stored by infoLogger
- Statistics extracted from logbook stream for each run
- statsCollector launched regularly
- Result stored back in database
- Web access to run logs (PHP scripts)

Logbook



statsBrowser



DATE logbook

<< < 1-10 of 5101 >> Show all

Run	Date	Start	End	LDCs	GDCs	Total events	Total data (GB)	GDC data rate (MB/s)	GDC Events/s	Duration (s)	Streams
1	15/08/2005	09:42:52	09:43:42	4	2	50004	4.1	80.5	735	34	1
2	15/08/2005	09:43:42	09:44:31	4	2	50004	4.1	58.8	714	35	1
3	15/08/2005	09:44:31	09:45:21	4	2	50004	4.1	59.8	725	34	1
4	15/08/2005	09:45:21	09:46:09	4	2	50004	4.1	59.0	714	35	1
5	15/08/2005	09:46:09	09:46:58	4	2	50004	4.1	59.6	725	34	1
6	15/08/2005	09:46:58	09:47:48	4	2	50004	4.1	57.0	694	36	1
7	15/08/2005	09:47:48	09:48:37	4	2	50004	4.1	59.9	725	34	1
8	15/08/2005	09:48:37	09:49:25	4	2	50004	4.1	60.6	735	34	1
9	15/08/2005	09:49:25	09:50:14	4	2	50004	4.1	59.7	725	34	1
10	15/08/2005	09:50:15	09:51:05	4	2	50004	4.1	59.8	725	34	1

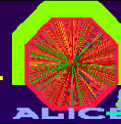
DATE site is ALICE1:ALICE/SSITE:DAQ [change] using database FEFSYEL00@postdb0.cern.ch.
[AutoRefresh](#) latest runs.

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Offline week: interface with DAQ - ECS databases - 4th October 2005

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statsBrowser



DATE logbook

```
Run 1
From 15/08/2005 09:42:52 to 15/08/2005 09:43:42

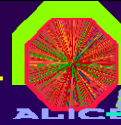
Run 1
--- Event Builder summary on pcald31 ---
INFORMATION:
Run start time: Mon Aug 15 09:43:04 2005, end time: Mon Aug 15 09:43:39 2005 Total: 35 s
Event counters (IN/OUT): 508/8/2 B/R: 8/2 F/H: 99414/25000 (50 incomplete) All events: 99430/25004 (50 incomplete)
Individual breakdown by LDC:
  mnomIdc33-pcald33 24418 Events 806.880 MB
  hmpIdc33-pcald33 25004 Events 415.811 MB
  mnomIdc36-pcald36 25004 Events 416.457 MB
  hmpIdc36-pcald36 25004 Events 414.269 MB
DAQ configuration: 4 LDC(s) 2 GDC(s) 1 recording stream(s) ldcPattern:3-4-5+6 gdcPattern:3+4 thisMachineId:3
EVF runtime: nbMacTriggersMaskId:2 dbMacId:169
  eventType: 508 all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) build applied on 2 event(s)
  eventType: 508 F all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) no-build
  eventType: 508 I all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) no-build
  eventType: 508 all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) build
  eventType: 508 all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) build
  eventType: 508 all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) build applied on 25000 event(s)
  eventType: CAL all-events targetMask:3:(pcalD33)+4:(pcalD34)+5:(pcalD35)+6:(pcalD36) build
4 input channel(s) active
EDM host: pcald31
Nearly full: 0, nearly empty: 0
Recorded: 25004 event(s) total: 2.055 GB at 58.720 MB/s 714 B/s average recordingDevice: '/dev/null' numStreams: 1 maxFileSize: 0 B runDuration: 35 seconds
25004 event(s) required 25004 write(s) for an average of 1.00000 write(s)/event
Memory system NUM_OF_LDCs: 4 totalSize: 134.209 MB privateSize: 100.652 MB (per LDC: 25.363 MB) publicSize: 33.550 MB maxEventSize: 4.000 MB MEM_PRIVATE: 0.750000 MEM_PUBLIC: 0
# Full/Allocations Public pool: 0/0 5-pcald35:0/24418 3-pcald31:0/25004 6-pcald36:0/25004 4-pcald34:0/25004
ERRORS:
50 incomplete event(s) detected
*****
Run 1
--- Event Builder summary on pcald32 ---
INFORMATION:
Run start time: Mon Aug 15 09:43:06 2005, end time: Mon Aug 15 09:43:39 2005 Total: 33 s
Event counters (IN/OUT): F/H: 99415/25000 (50 incomplete) All events: 99415/25000 (50 incomplete)
Individual breakdown by LDC:
  mnomIdc33-pcald33 24415 Events 811.744 MB
  hmpIdc33-pcald33 25000 Events 416.128 MB
```

S.Chapeland

Offline week: interface with DAQ - ECS databases - 4th October 2005

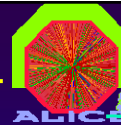
10

Information available



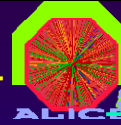
- Run number
- Start time
- End time
- number of LDCs
- number of GDCs
- Total events
- Total data (GB)
- GDC data rate (MB/s)
- GDC Events/s
- Duration (s)
- Streams

Interface



- Data stored in MySQL database
- Use of the MySQL library to retrieve values
- Power of SELECT statement
- Available for multiple languages
- Can change schema without changing queries
- Easy to use

Example C program

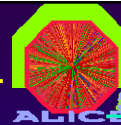


```
/*
  Example program to query DAQ logbook database
  using MySQL client library.
  Requires MySQL client/dev/shared packages to be installed.
  gcc logbook_access.c `mysql_config --cflags` `mysql_config --include`
  `mysql_config --libs` -o getLogbook
*/

#include <stdio.h>
#include <mysql.h>

/* database access parameters */
#define MYSQL_USER "offline"
#define MYSQL_PWD "xxx"
#define MYSQL_HOST "pcaldxx.cern.ch"
#define MYSQL_DB "LOGBOOK"
```

Example C program



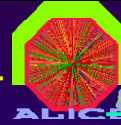
```
int main() {

  MYSQL dbsql;
  MYSQL_RES * result;
  MYSQL_ROW row;
  char * query;
  unsigned int numfields,i;

  /* init mysql handle */
  mysql_init(&dbsql);

  /* connect to database */
  if
  (mysql_real_connect(&dbsql,MYSQL_HOST,MYSQL_USER,MYSQL_PWD,MY
SQL_DB,0,NULL,0)==NULL) {
    printf("Failed to connect to database: %s\n",mysql_error(&dbsql));
    return -1;
  }
}
```

Example C program



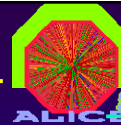
```
/* define query */
query="select run, time_start, time_end, totalEvents, totalData, averageDataRate
from logbook order by time_start desc limit 10";

/* execute query */
if (mysql_query(&dbsql,query)!=0) {
    printf("Failed to execute query: %s\n",mysql_error(&dbsql));
    return -1;
}

/* retrieve result (full result stored in local memory) */
result = mysql_store_result(&dbsql);
if (result==NULL) {
    printf("Failed to retrieve query result: %s\n",mysql_error(&dbsql));
    return -1;
}

/* get number of columns of result */
numfields=mysql_num_fields(result);
```

Example C program



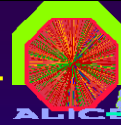
```
/* loop over result row by row */
while ((row = mysql_fetch_row(result))!=NULL) {
    /* print each column of the current row */
    for (i=0;i<numfields;i++) {
        printf("%s\t",row[i]);
    }
    printf("\n");
}

/* free resources of result */
mysql_free_result(result);

/* close connection */
mysql_close(&dbsql);

return 0;
}
```

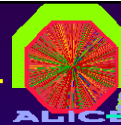

Example query



```
select run, time_start, time_end,  
totalEvents, totalData, averageDataRate  
from logbook
```

Query is unchanged
if adding new columns in table

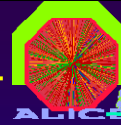
Table splitting



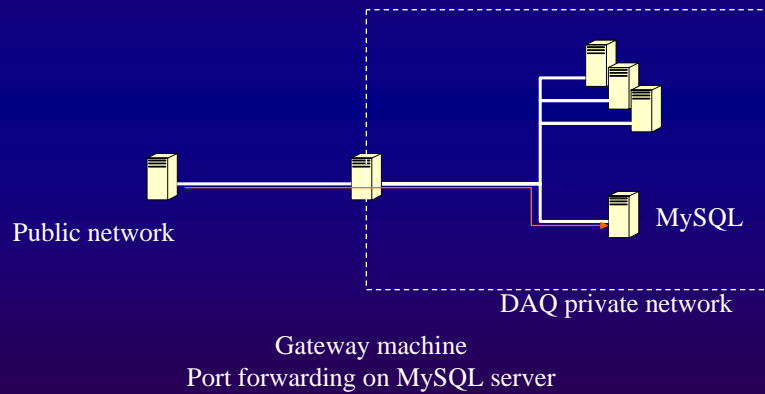
- Should be foreseen from the beginning (millions of runs)
- Add one level of indirection to the query

```
Select table_name from logbook_index  
where run_min <= myrun  
and run_max >= myrun
```

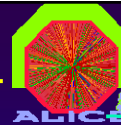
Database access



- Firewall configuration

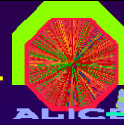


Practical points



- Publication of EOR via DIM to trigger queries
- Information to be stored

Information to be stored



- Detectors participating to the run
- EOR status
- Run type, beam type
- HLT mode
- Files location

What else?