CAS (Central Analsis Server) and GC planning

D. Olson

ANL GC Mtg

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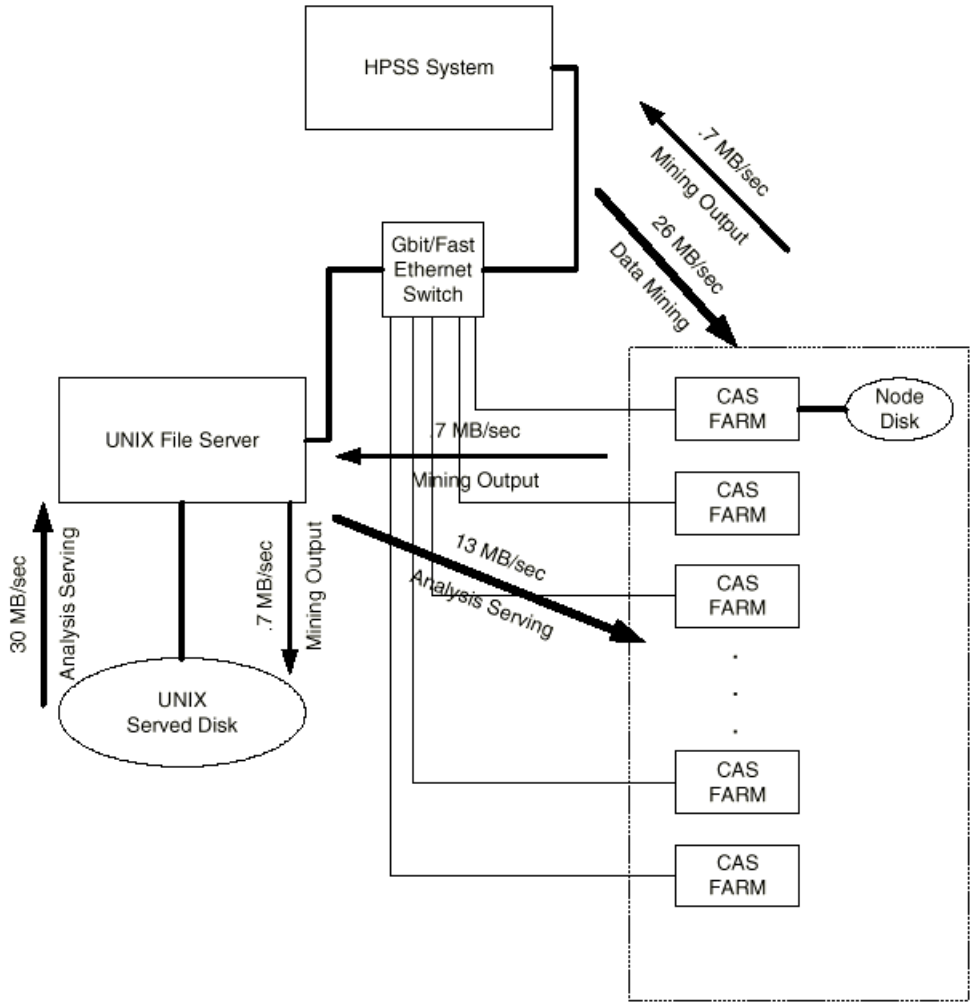
Outline

- RHIC CAS Task Force
- Doug’s presentation to task force
- Discussion

CAS Task Force

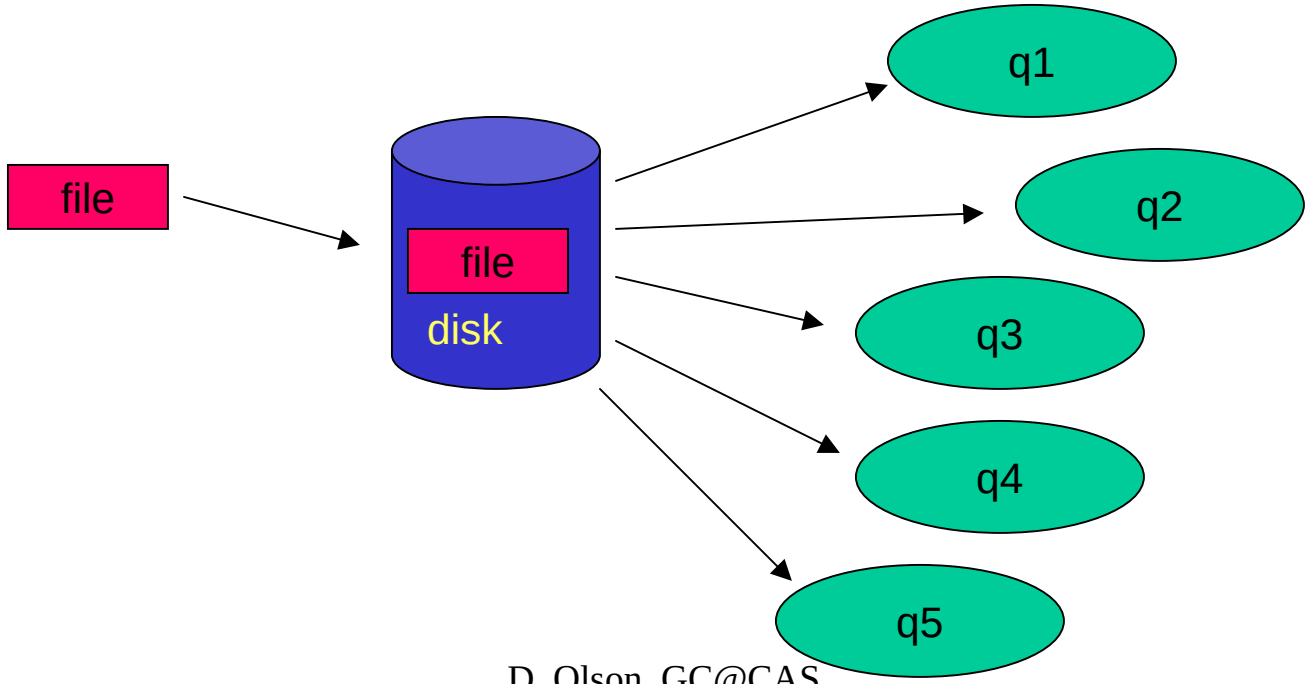
- A committee with reps from RCF, RHIC experiments and GC are discussing the setup for the Central Analysis Server.
- April - May 1999 time frame.
- Goal is to define configuration for FY00 (RHIC expt. startup)

Data Flow for "Average" Experiment (min. node disk)



The optimization?

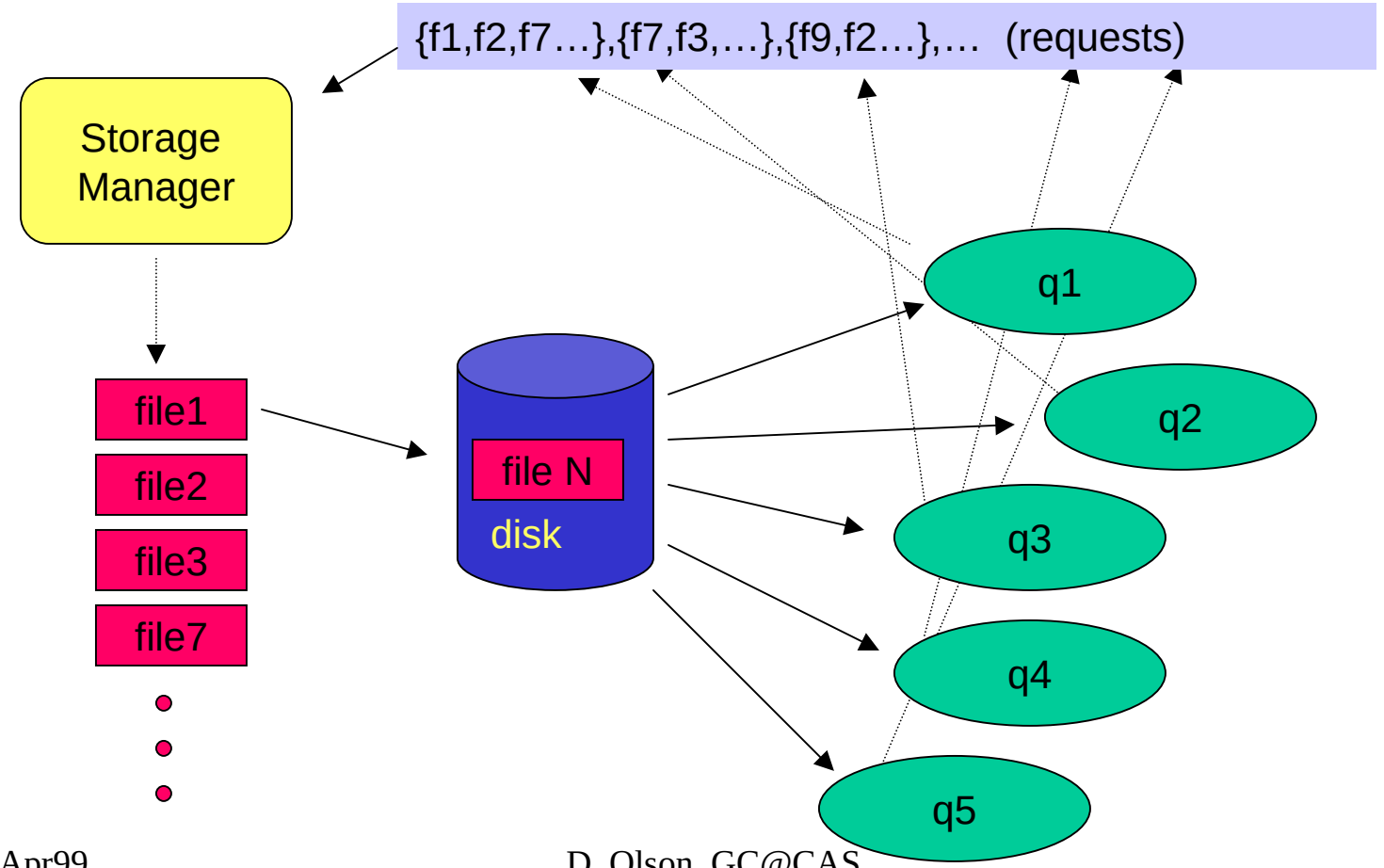
Read once from tape to disk, access by many processes from disk. The disk<->process bandwidth is much greater than the tape<->disk bandwidth.
Also, disks can be read very many times. Tapes can be read a finite number of times due to media and head wear.



How to optimize?

- Each process (query) should request many files.
- Storage manager optimizes order of file delivery and access by processes to minimize number of tape reads.

How to optimize (2)



How to optimize (3)

- Figure is simplified view:
  - request is list of interesting physics objects (events & components) and not just files
  - Storage manager maps physics objects to files and coordinates across multi-file event components

What is relation between file on disk and query process?

- Case 1: process reads every byte in file
  - **CPU intensive analysis:**
    if read rate << network bandwidth
    --> put file on local disk (like CRS)
  - **I/O intensive analysis or data mining:**
    if read rate >= network bandwidth
    --> run process on shared disk server

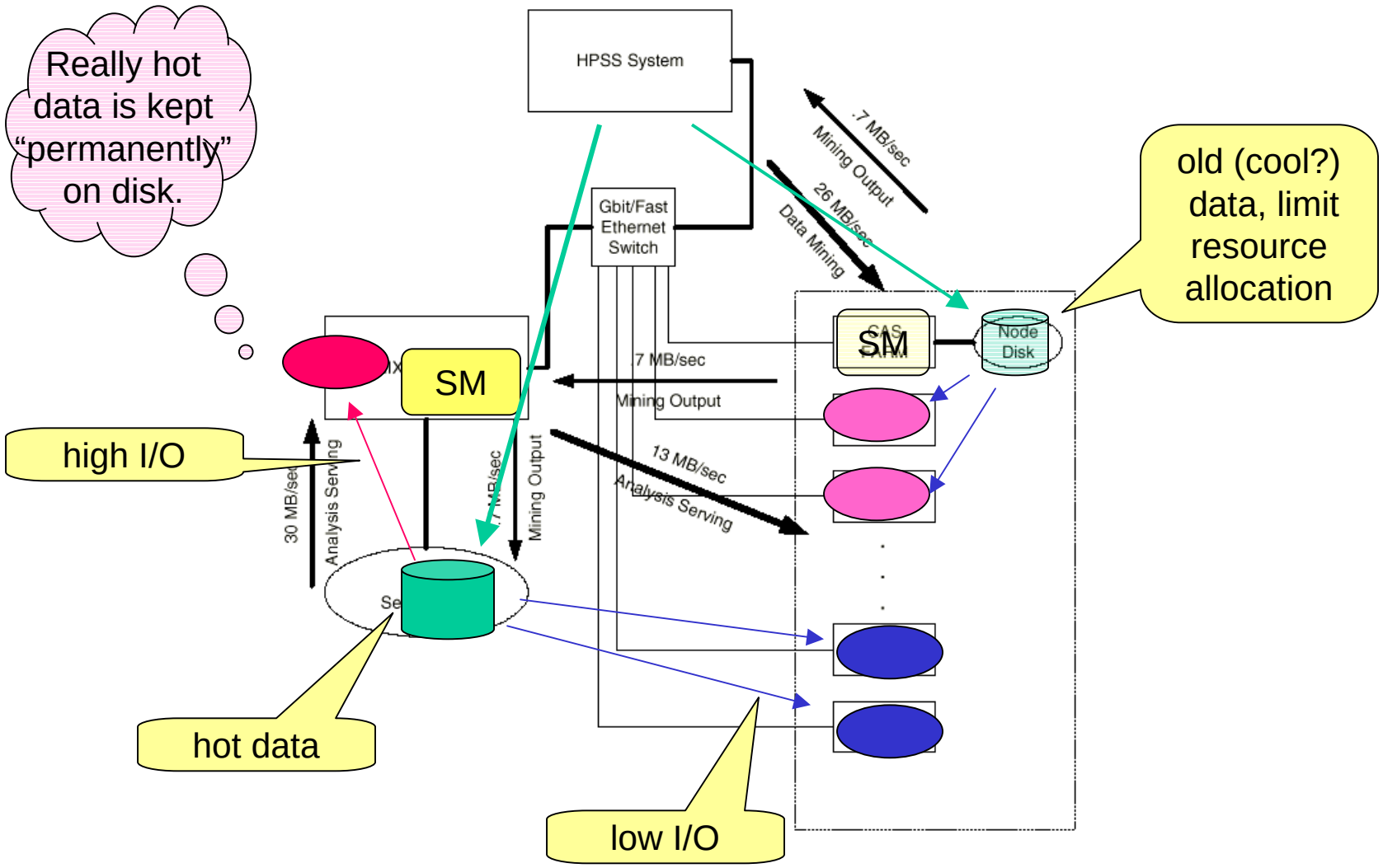
What is relation between file on disk and query process?

- Case 2: process needs few bytes from file
  - **CPU intensive physics analysis**
    read rate < network bandwidth
    leave file on shared network disk
    run process on farm node
  - **I/O intensive physics analysis**
    read rate >= network bandwidth
    run process on shared disk server

Characteristics of the shared disk

- How much space?
  - an optimization parameter, depends upon usage
- Use HPSS disk?
  - No. It can not handle fine-grained access.
- Unix server?
  - good for high-bandwidth read
- Use single farm node shared disk?
  - works for low-bandwidth read
- I would start with Unix server disk and also use a farm node as shared disk if necessary.

What is granularity of a Storage Manager - data system instance?

- The largest set of data likely to be accessed by overlapping queries (analysis codes) and for which the same set of attributes apply.
- Probably corresponds to 1- few macro runs per year, per experiment. I.e., same beam / detector configuration.
- The resource allocated to each instance is disk cache size, which is a configuration parameter.

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