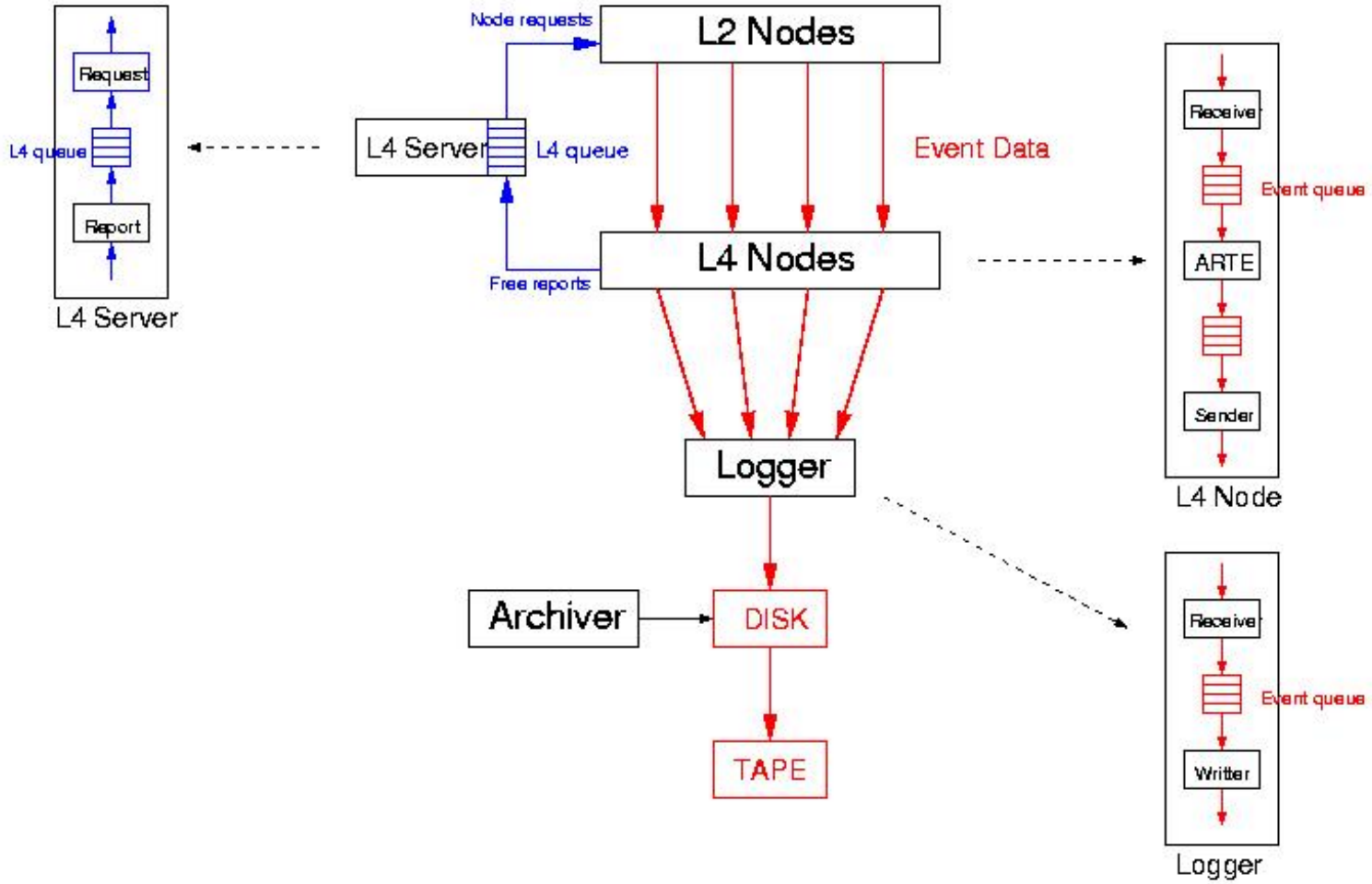
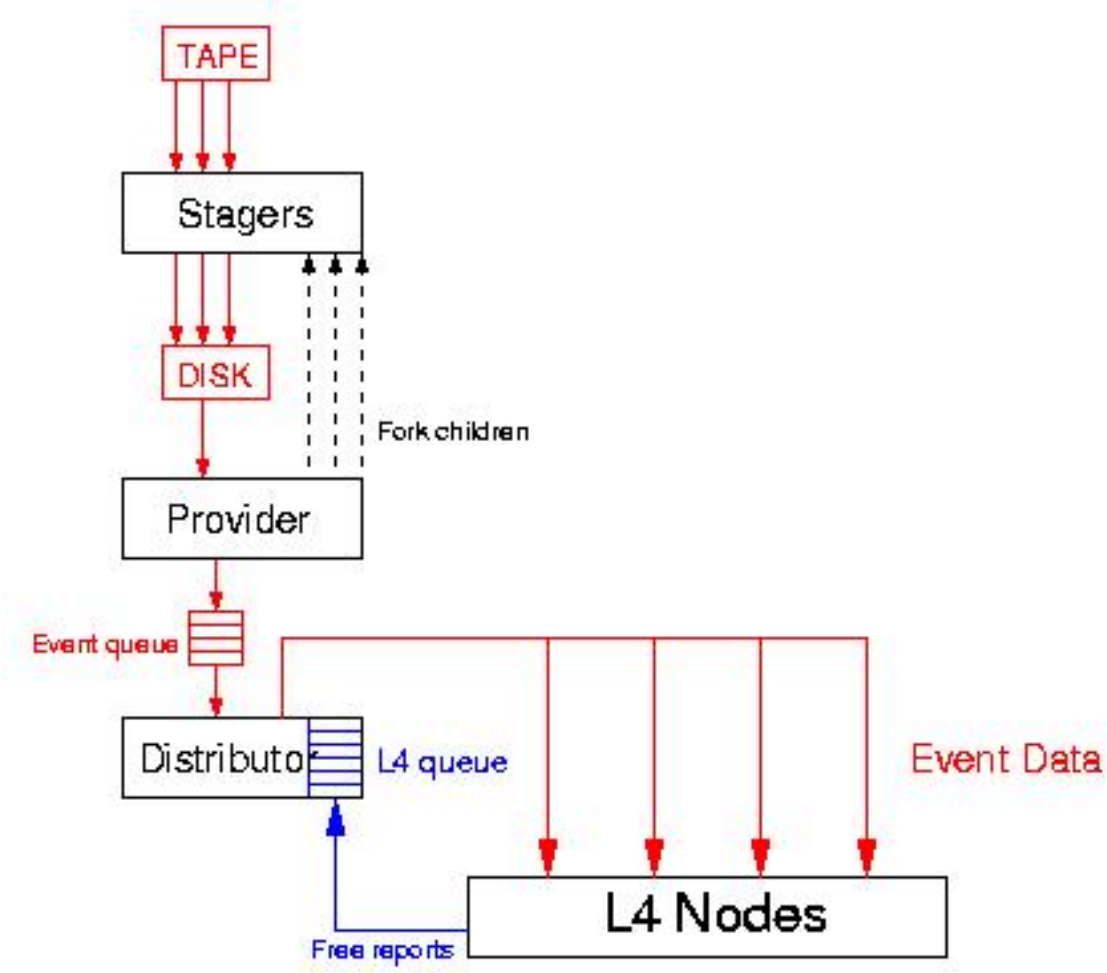
Reprocessing Status

- Reprocessing machinery
- Status of rp0002 reprocessing
- Problems and solutions

Data Taking


Request
L4 queue
Report
L4 Server
Node requests
L2 Nodes
L4 Server
L4 queue
Event Data
Free reports
L4 Nodes
Logger
Archiver
DISK
TAPE
Receiver
Event queue
ARTE
Sender
L4 Node
Receiver
Event queue
Writter
Logger

Reprocessing



Reprocessing machinery

- Goal: Make Reprocessing automatic and efficient using vast L4 CPU power
- Use EventProvider/EventDistributor processes to feed the L4 nodes with events
- Use logging and archiving processes
- Use DAQ process manager and Run Control to boot and control all the processes
- Use Online DB caches for loading CnA constants
- Use exactly the same Data Quality Monitoring
- Error Logger and REPRO monitor
- Data taking in parallel is possible

Configuration for rp0002

- Configuration
  - ARTE-03-08-r5 version
  - Key Tables Revision 13 (14)
    - Problem with VDS alignment found on Feb 16th affecting J/Psi $\rightarrow$ ee runs and last J/Psi $\rightarrow \mu\mu$ runs. Reprocessing resumed on Feb 20th with Key Table Revision 14
  - MINIs kept on disk:

    /hb/mini/data/REAL/00/exp03/mini/runXXXX/rp0002_*
  - V. Rybnikov: Running Reprocessing
  - R. Baghshetsyan: Data Management

Status rp0002

Run Type	Run Range	# Runs	# Events	Size (GB)
Min. Bias	14543-14654	57	4176617	727
Hard Photon	17100-17112	10	638572	78
Single Lepton	17116-17266	23	4643755	966
J/Psi $\rightarrow \mu\mu$	15820-17180	230	5425495	787
Total		320	14884439	2558
J/Psi $\rightarrow$ ee	15036-17068	372	(16292359)	

Status rp0002

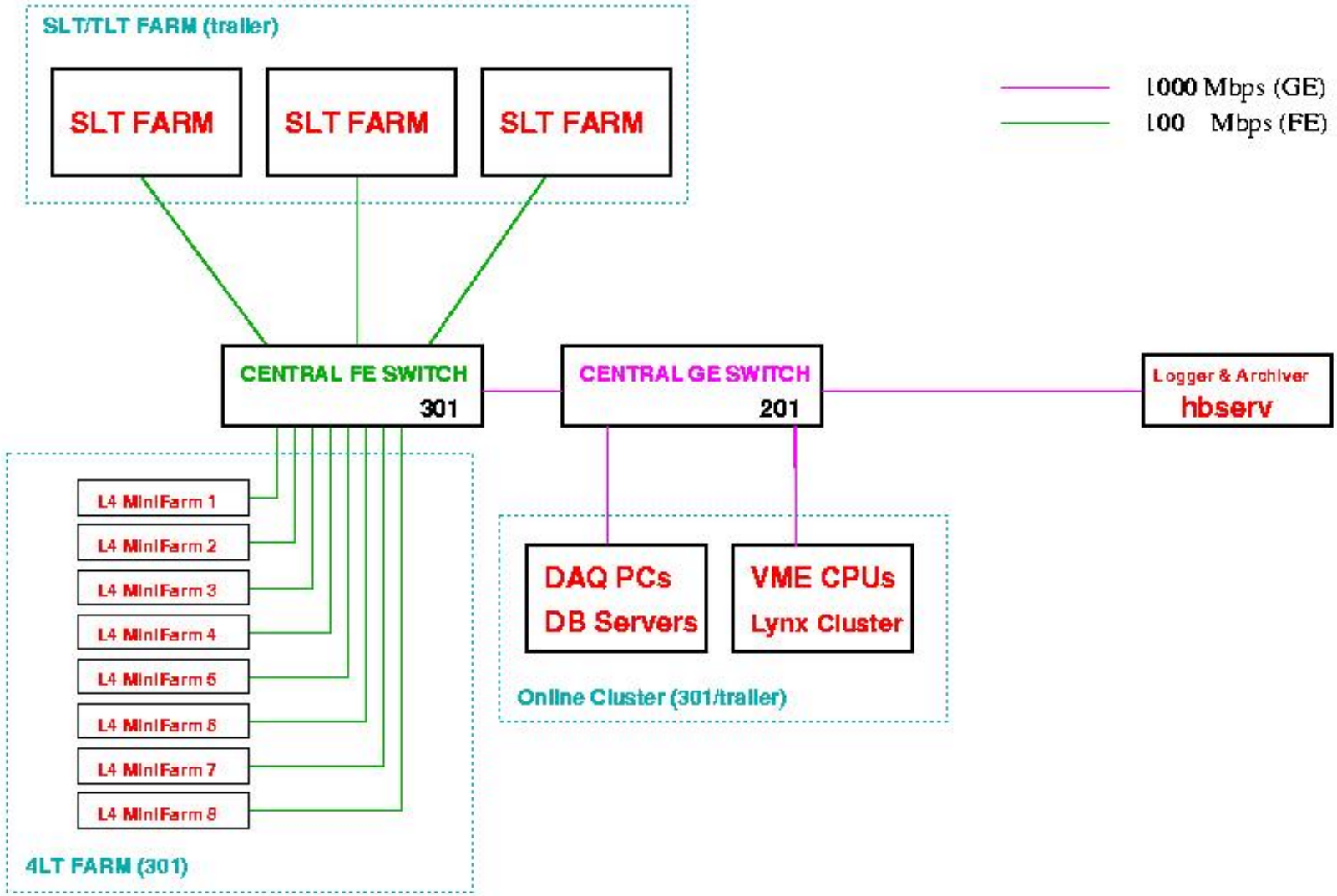
- Performance
  - Time elapsed since reprocessing started: 22 days, 2 hours
  - Time reprocessing up: 12 days, 23 hours
  - Efficiency: 58 %
  - Average rate: 20 Hz (peak performance 25 Hz)

  - Average Event Processing time: 3-7 secs.
    - PID (20%), Ranger (20%), Matching (10%), RICH (30%)

Status rp0002

- Inefficiencies
  - Problems during night not recovered until the morning
  - SMC state transitions when changing run
    - Problem in DQ gatherer not yet understood
  - TAPE Robot down
  - DB servers
    - DB caches corruption
    - Speed and reliability of CnA constants loading limited by DB server performance: Implement rpm multithreading
  - Problem in Logger Writer process (fixed)

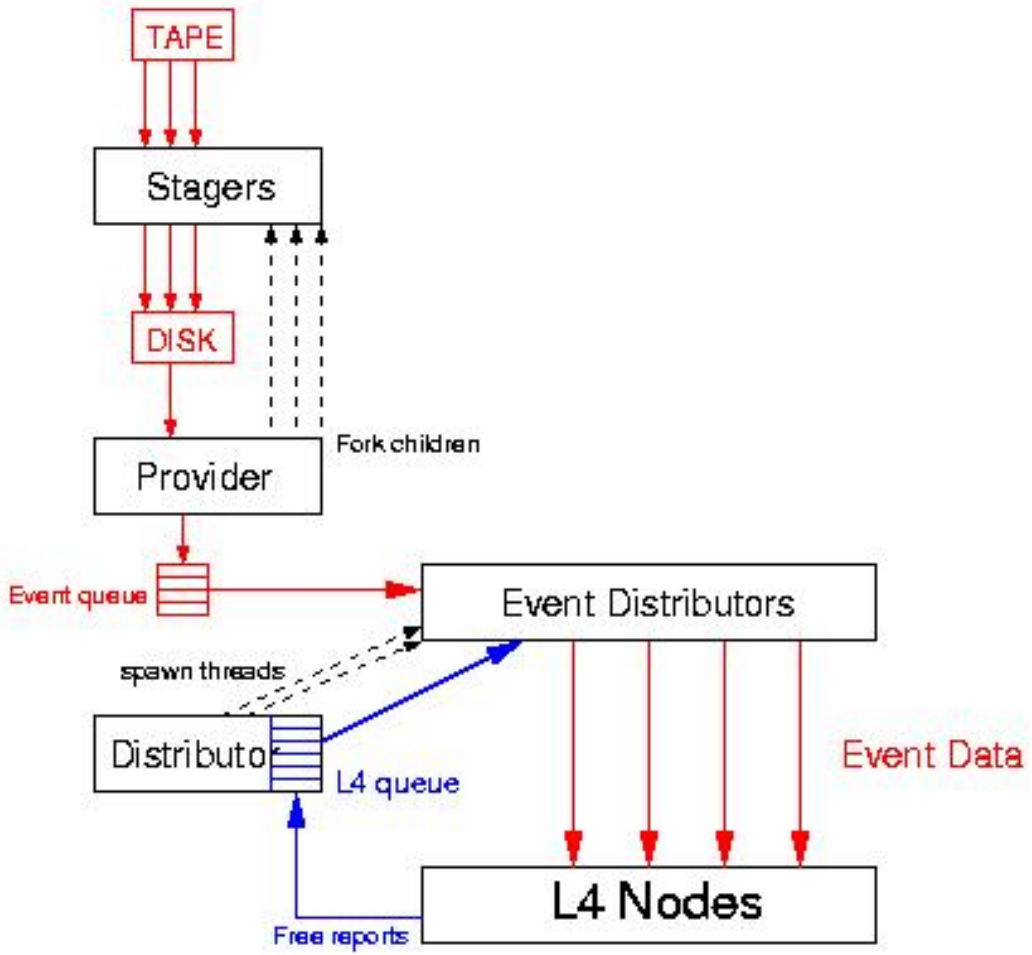
HERA–B NETWORK INFRASTRUCTURE



Status rp0002

- Other problems
  - Data Quality Database
    - Corruption of DQ Histogram Database
    - Workaround: periodic reset of DB and provide DQ histograms in root files
- Room for improvements
  - Reprocessing rate limited either by:
    - Event Processing time in ARTE (30 Hz for 6 sec/event)
    - CPU power of event distribution and logging machine
      - Dedicated machine
      - Successful reprocessing tests done in new machine
    - EventDistributor process (25 Hz)
      - Improve event transmission protocol
      - Introduce multithreading

Event Distribution



Summary

- The reprocessing machinery is providing a framework which allows to reprocess the data as fast as we took them (limited by event reconstruction time).
- Current performance 1-2 million events/day

- The reprocessing machinery is using the online resources used for data taking, so
  - Any improvement in Run Control, Event Distribution, Event Reconstruction, Data Quality, Logging, Archiving … will be used in the next data taking period