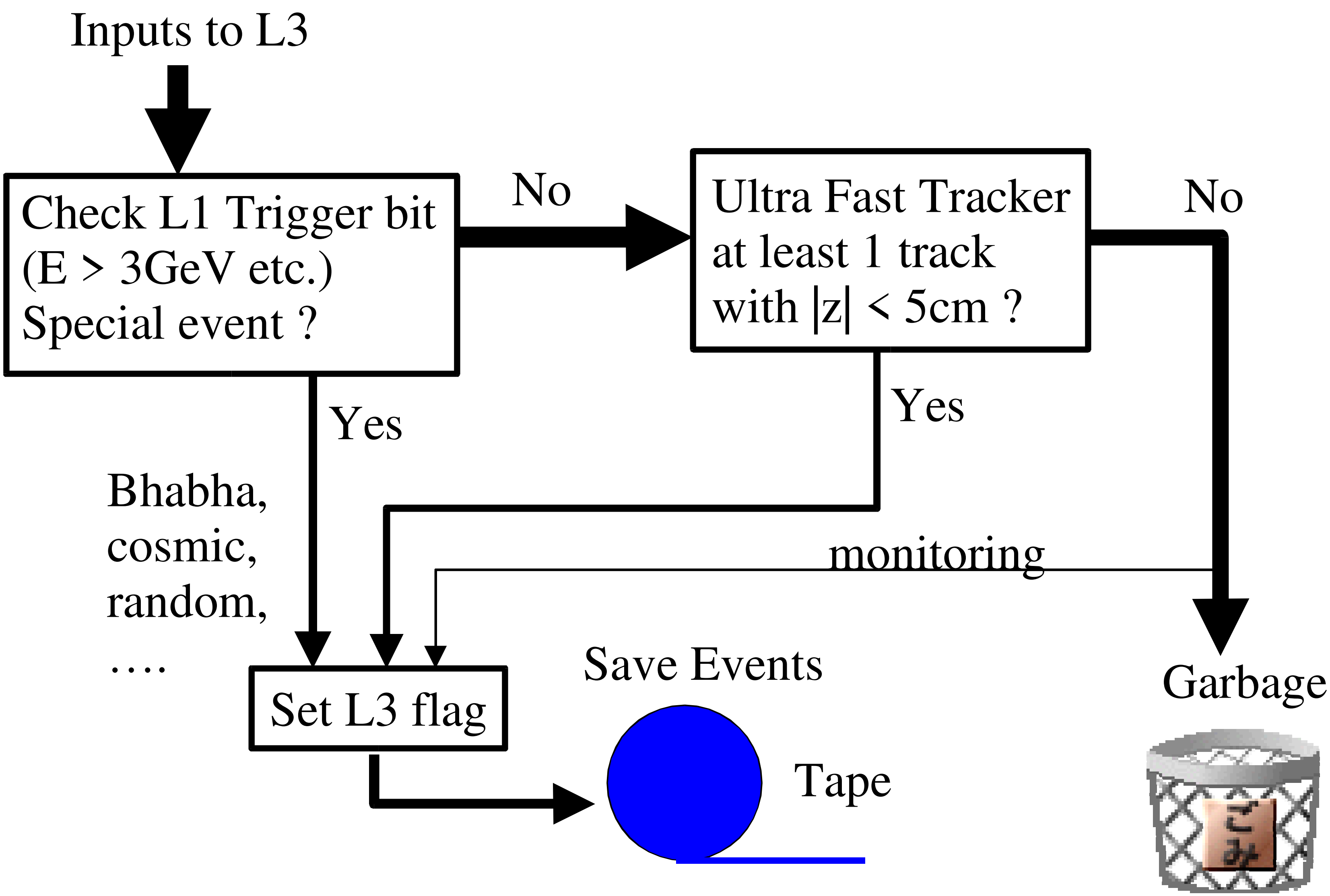
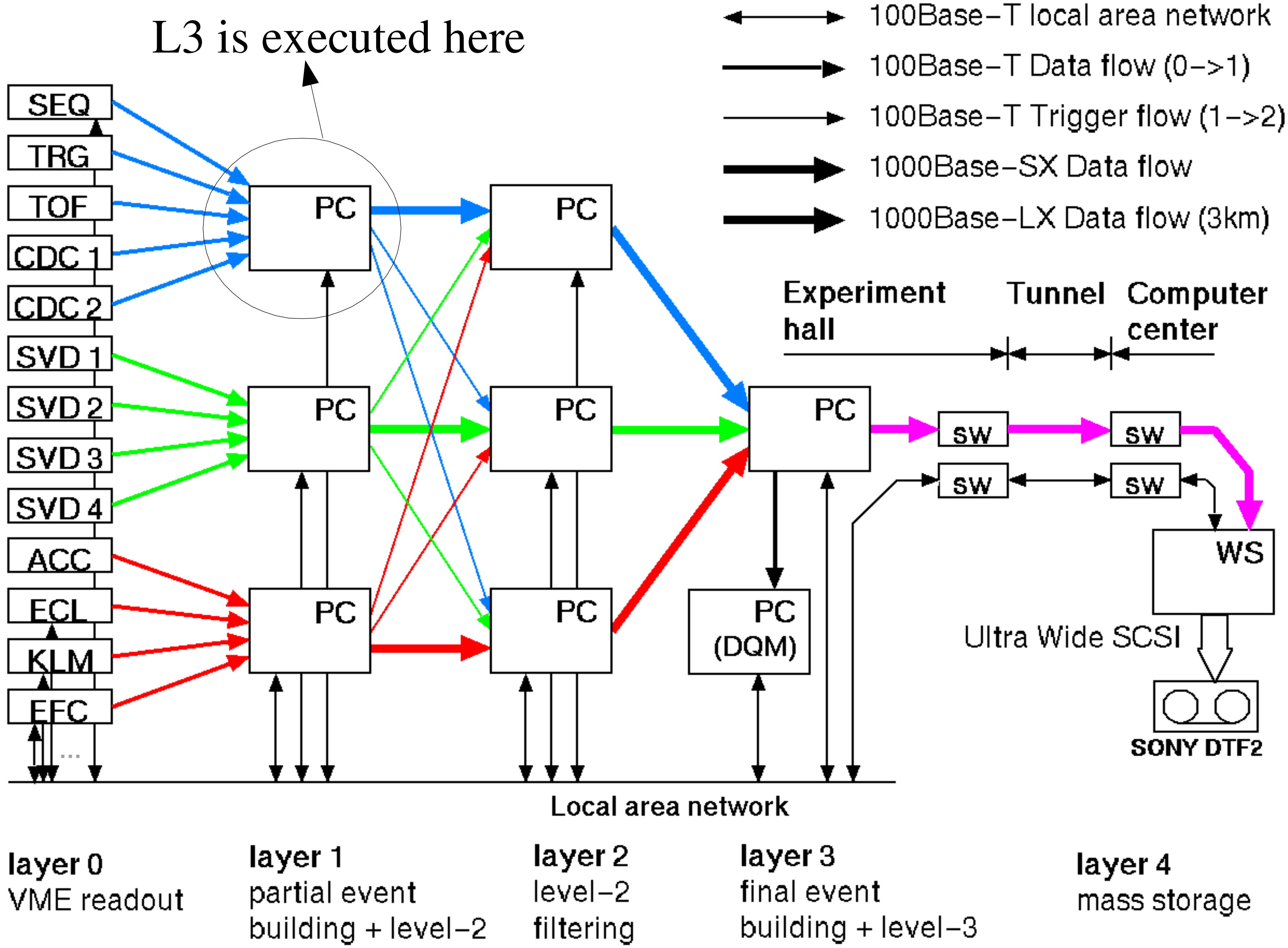
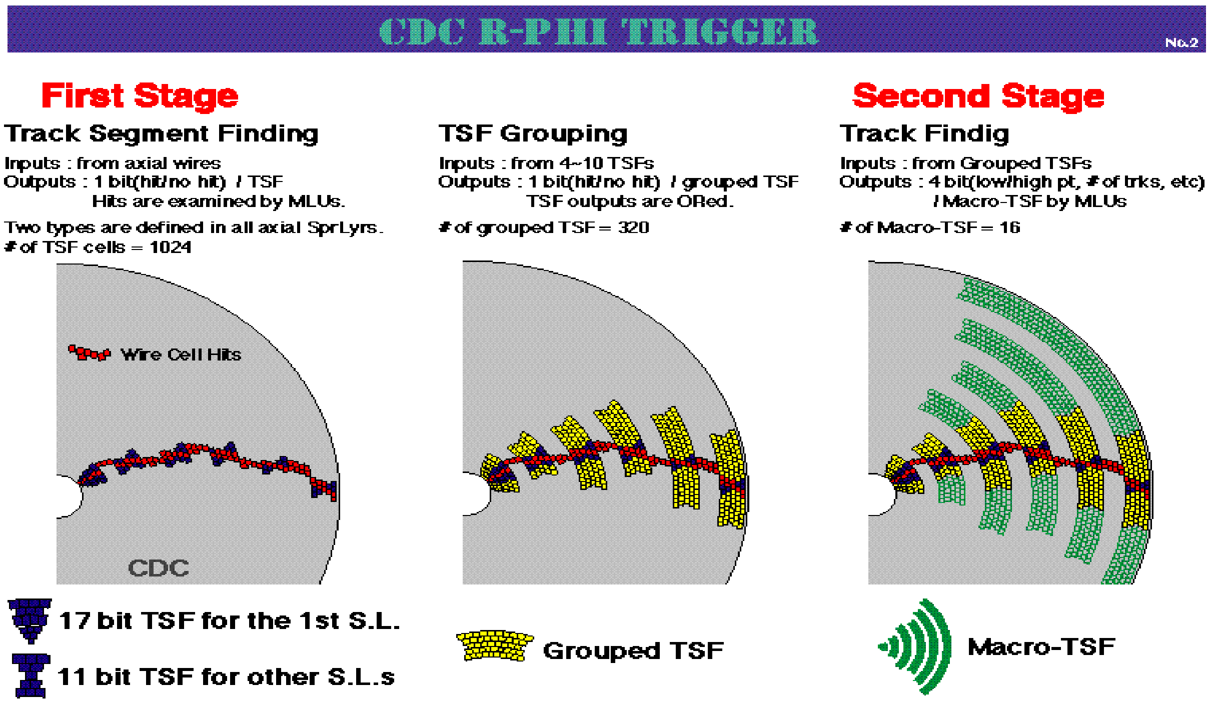
Level 3 (L3) Trigger Data Flow




L3 is executed here
100Base−T local area network
100Base−T Data flow (0−>1)
100Base−T Trigger flow (1−>2)
1000Base−SX Data flow
1000Base−LX Data flow (3km)
SEQ
TRG
TOF
CDC 1
CDC 2
SVD 1
SVD 2
SVD 3
SVD 4
ACC
ECL
KLM
EFC
PC
PC
PC
PC
PC
PC
PC
PC (DQM)
Experiment hall
Tunnel
Computer center
sw
sw
sw
sw
WS
Ultra Wide SCSI
SONY DTF2
Local area network
layer 0
VME readout
layer 1
partial event building + level−2
layer 2
level−2 filtering
layer 3
final event building + level−3
layer 4
mass storage

Algorithm of fast tracker

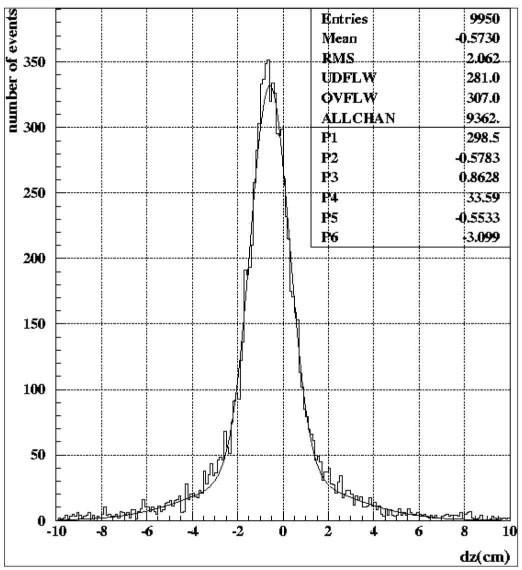
1. examine r–phi trigger hits and find tracks by memory lookup using finer patterns than those used in hardware trigger.



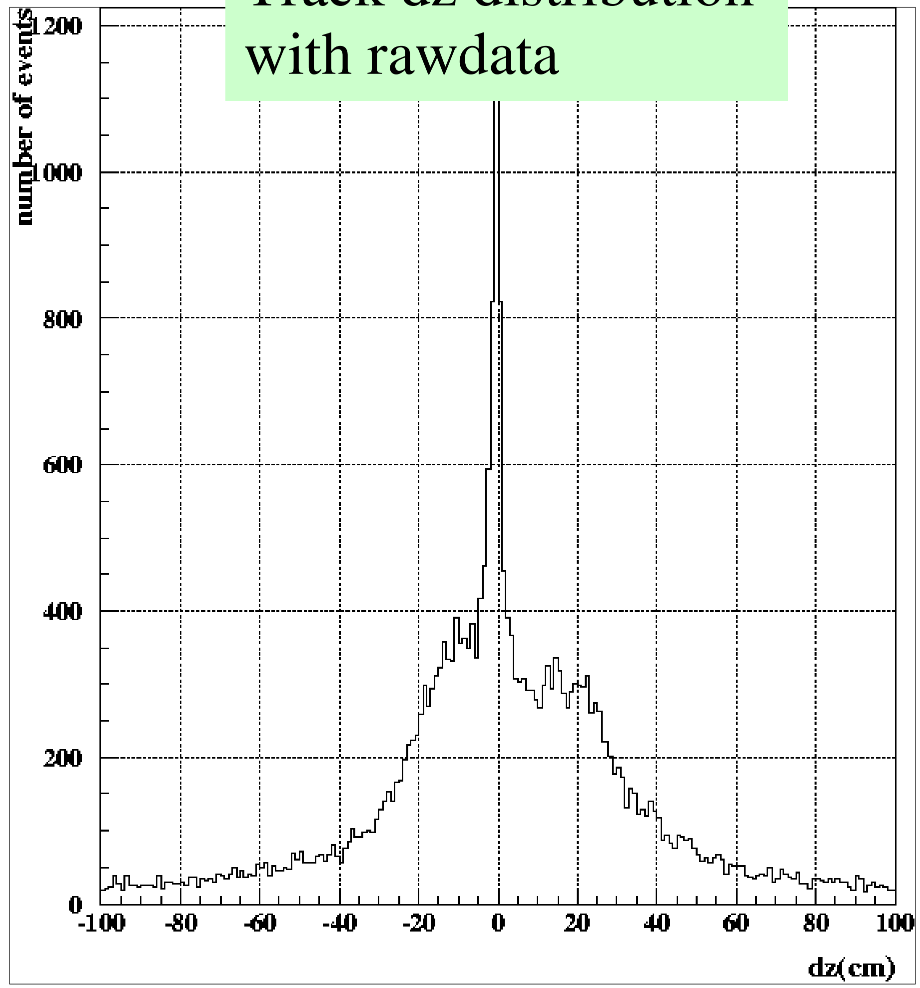
2. Track fitting using actual CDC hits
   - TDC info used
   - simple x–t relation (linear) assumed
   - stereo wires are also used for z–tracking

Level 3 Ultra Fast Tracker

– Memory–lookup technique is used
  - Effective for Pt > 350MeV/c
– Drift–time info. is used
  - dz resolution ~9mm
    - obtained with $ee \rightarrow \mu\mu$



Track dz distribution with rawdata



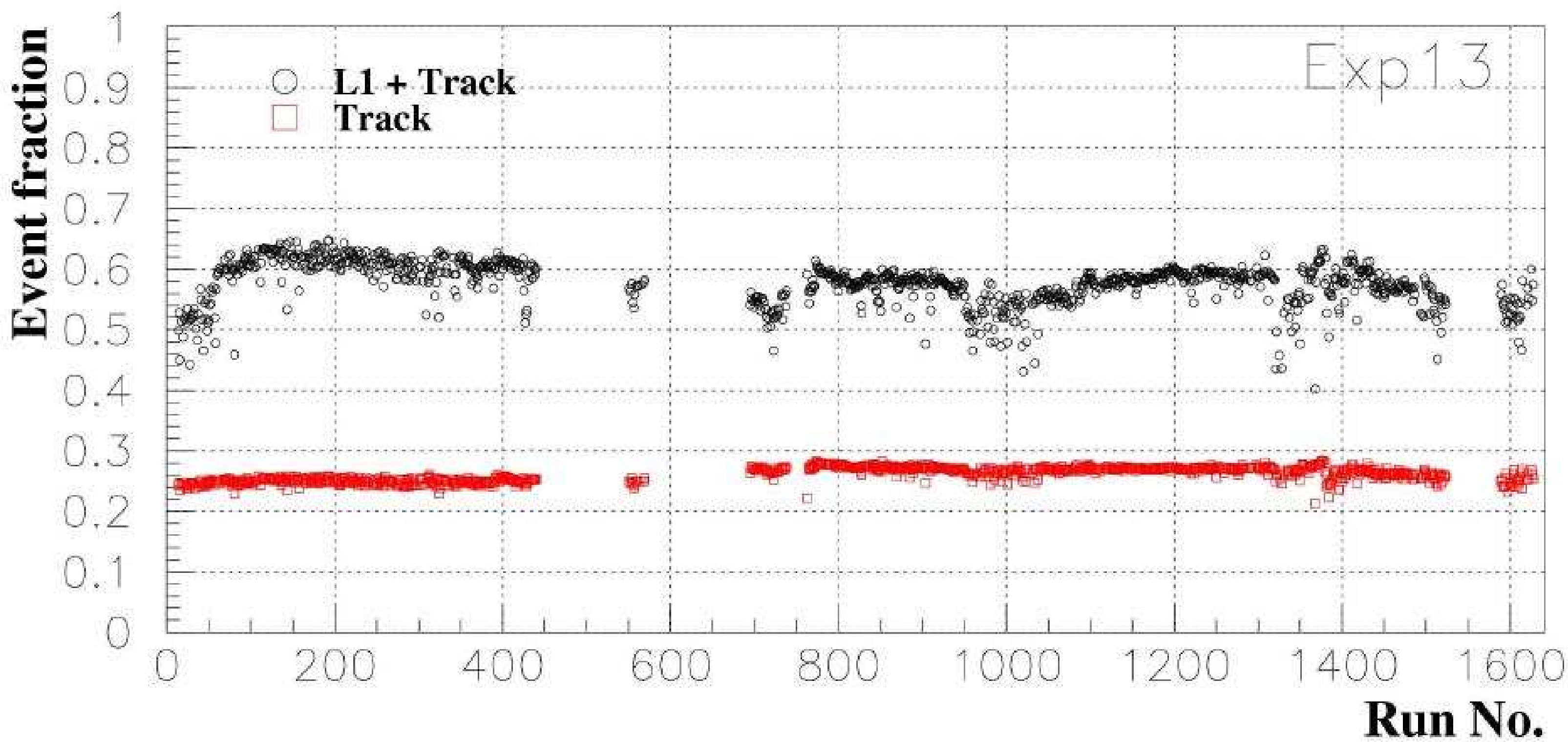
Performance of Level 3 Trigger

Efficiency > 99% for B events

> 99% for $\tau^+\tau^-$ candidates

No deadtime (OK up to ~1kHz)

Background rejection (see the figure below)



Upgrade plan

– Use of SVD data in Level 3 trigger

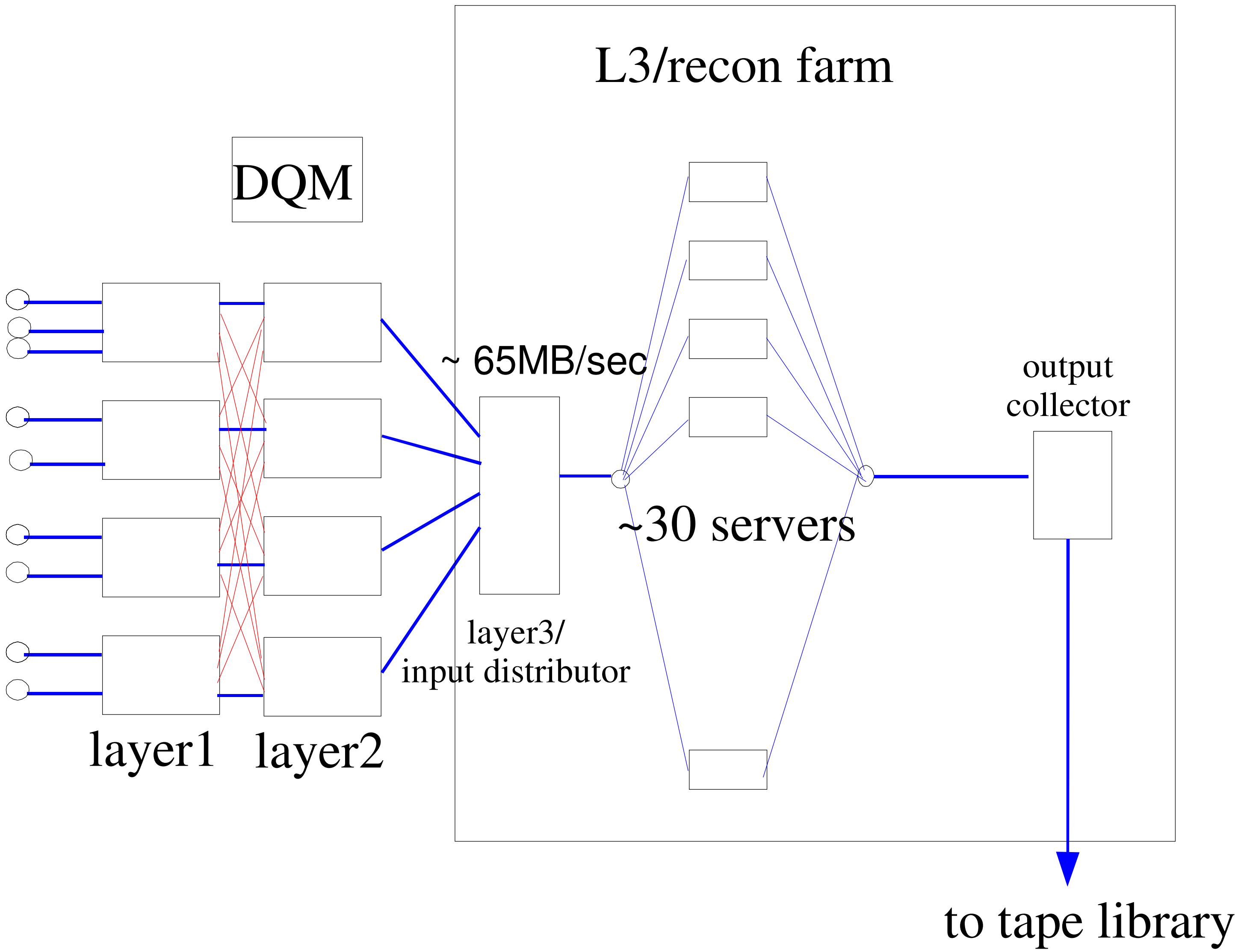
a) SVD only Level 2 trigger
– rough tracking using SVD data only (3 layers)

b) Tracking combined with current Level 3 tracker

– Run offline filter in DAQ data flow (–>R&D for Super KEKB)

* Upgrade of event building farm is being planned
<– addition of reconstruction farm after event building farm

* Event selection based on real time full–reconstruction
"Physics Trigger"


L3/recon farm
DQM
~ 65MB/sec
output
collector
~30 servers
layer3/
input distributor
layer1
layer2
to tape library