L3 filter options for GLUEX

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Preamble

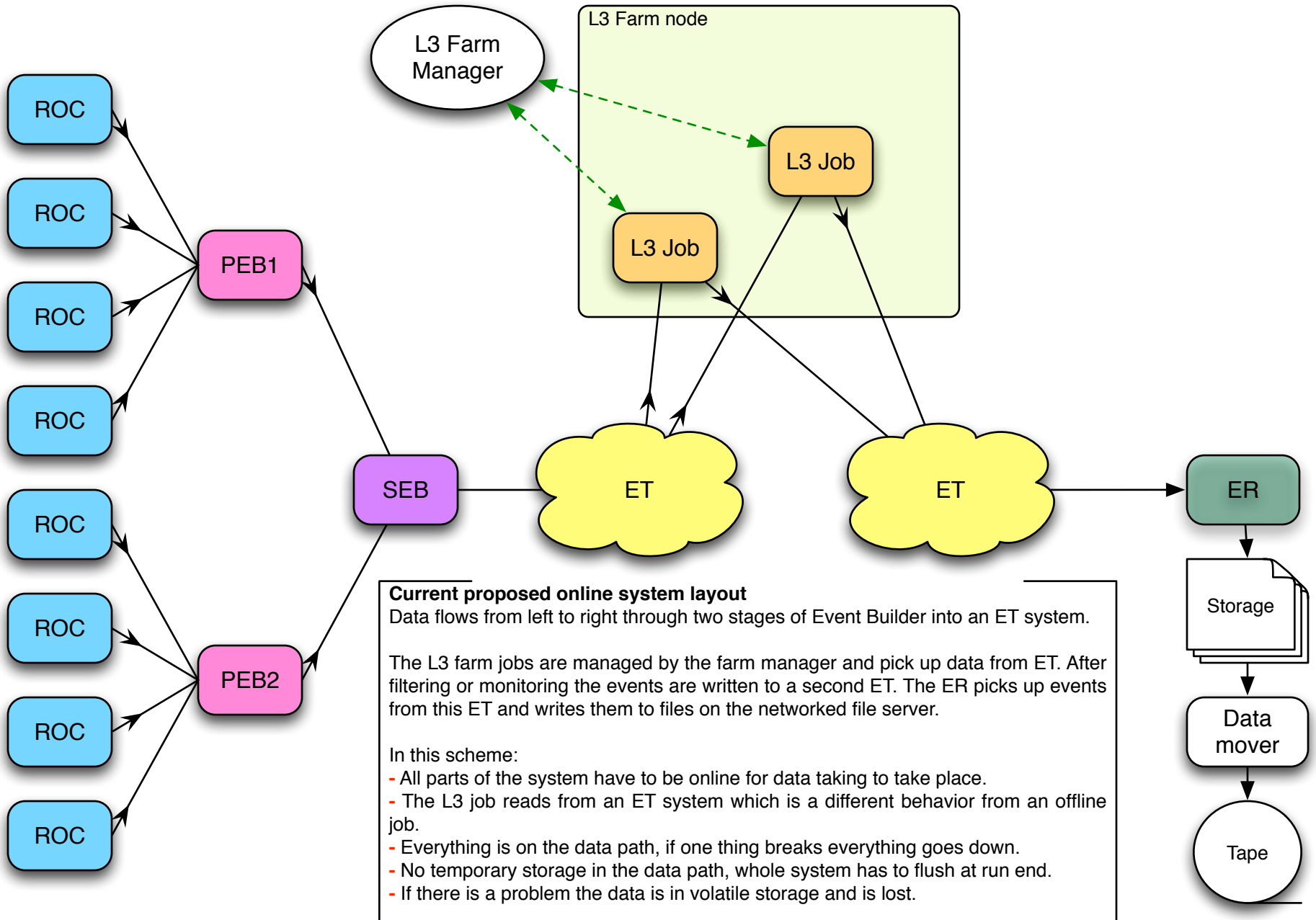
- There are many ways that a L3 filter could be implemented using components from CODA. Up to this time nobody has implemented a L3. There were plans for CLAS in the 6 GeV program but it was never needed at the CLAS data rates. Vardan has developed a design for a L3 farm manager but how the farm hooks into the online has not been settled.

- The projected GLUEX rates are manageable in terms of data transport and computing power for data manipulation such as event building, disentangling and online filtering. Unfortunately the cost of archiving such a volume of data to tape is, at current pricing, prohibitive. Some form of L3 filter is required before the data goes to tape.

- What form this filter would take was deferred because the first year or so of GLUEX running will be at low luminosity.

- Recently interest has been expressed in having some sort of L3 early.

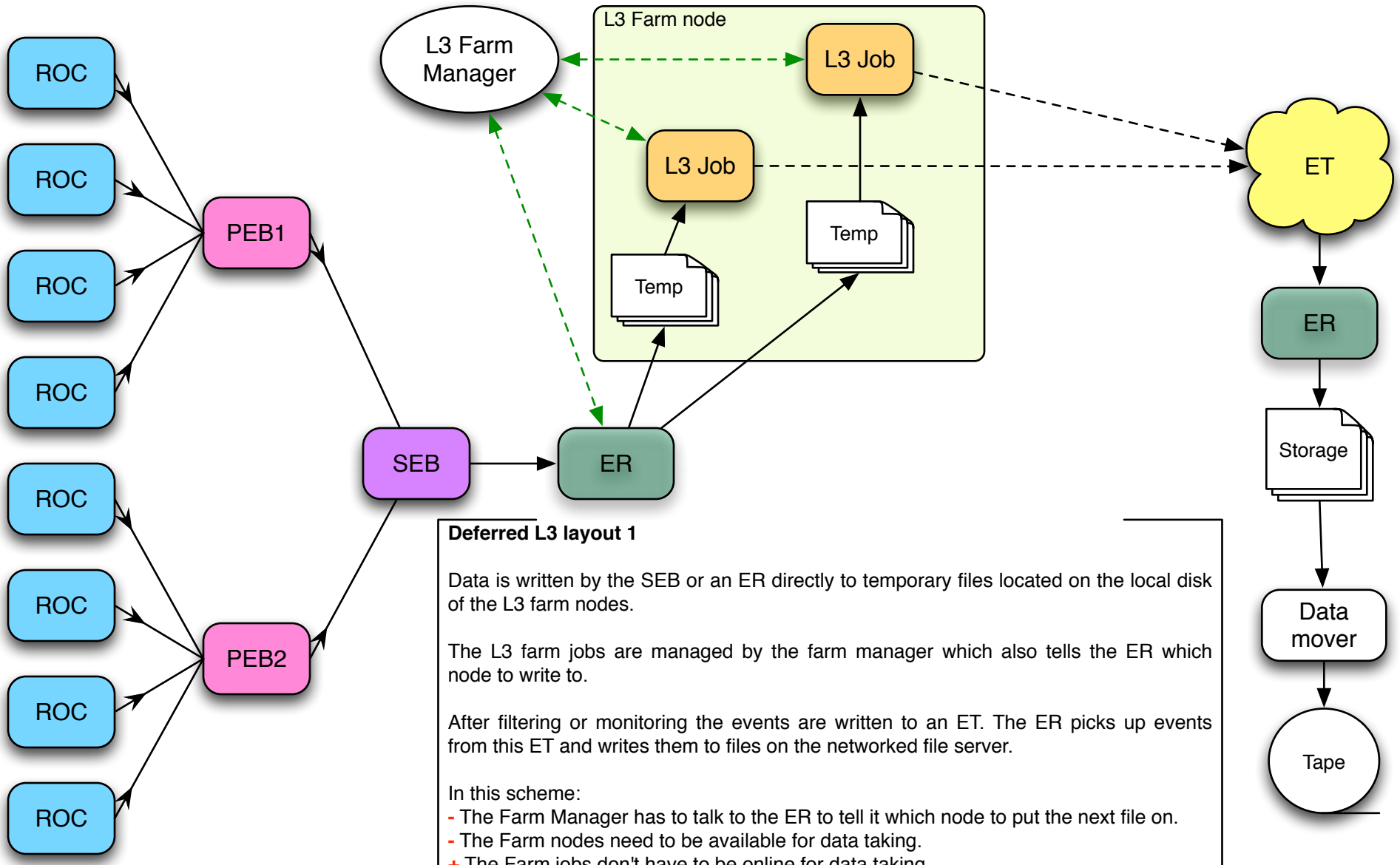
- This presentation will look at a few options and will hopefully help to start discussion.



Current proposed online system layout
Data flows from left to right through two stages of Event Builder into an ET system.

The L3 farm jobs are managed by the farm manager and pick up data from ET. After filtering or monitoring the events are written to a second ET. The ER picks up events from this ET and writes them to files on the networked file server.

In this scheme:
- All parts of the system have to be online for data taking to take place.
- The L3 job reads from an ET system which is a different behavior from an offline job.
- Everything is on the data path, if one thing breaks everything goes down.
- No temporary storage in the data path, whole system has to flush at run end.
- If there is a problem the data is in volatile storage and is lost.



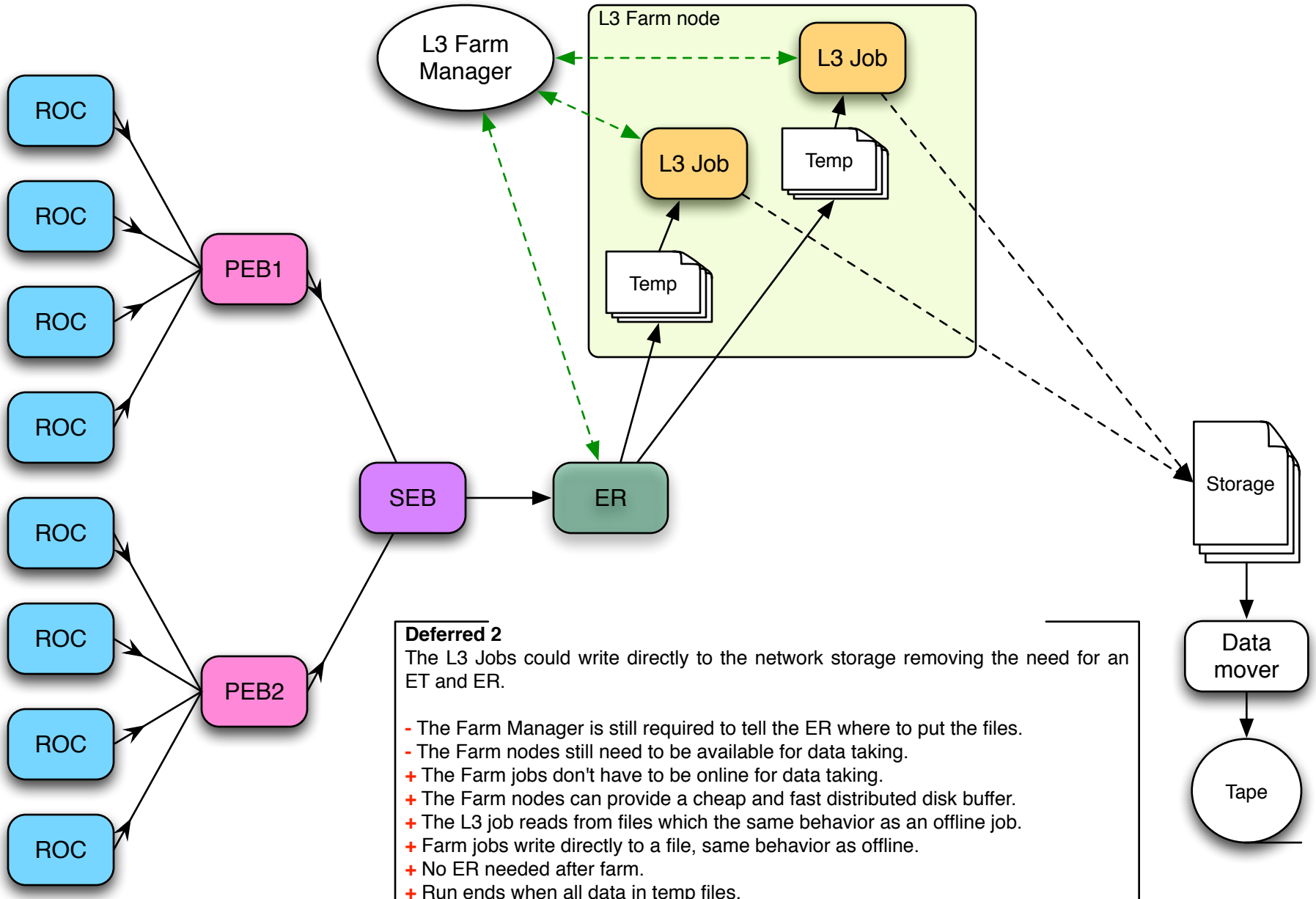
Deferred L3 layout 1

Data is written by the SEB or an ER directly to temporary files located on the local disk of the L3 farm nodes.

The L3 farm jobs are managed by the farm manager which also tells the ER which node to write to.

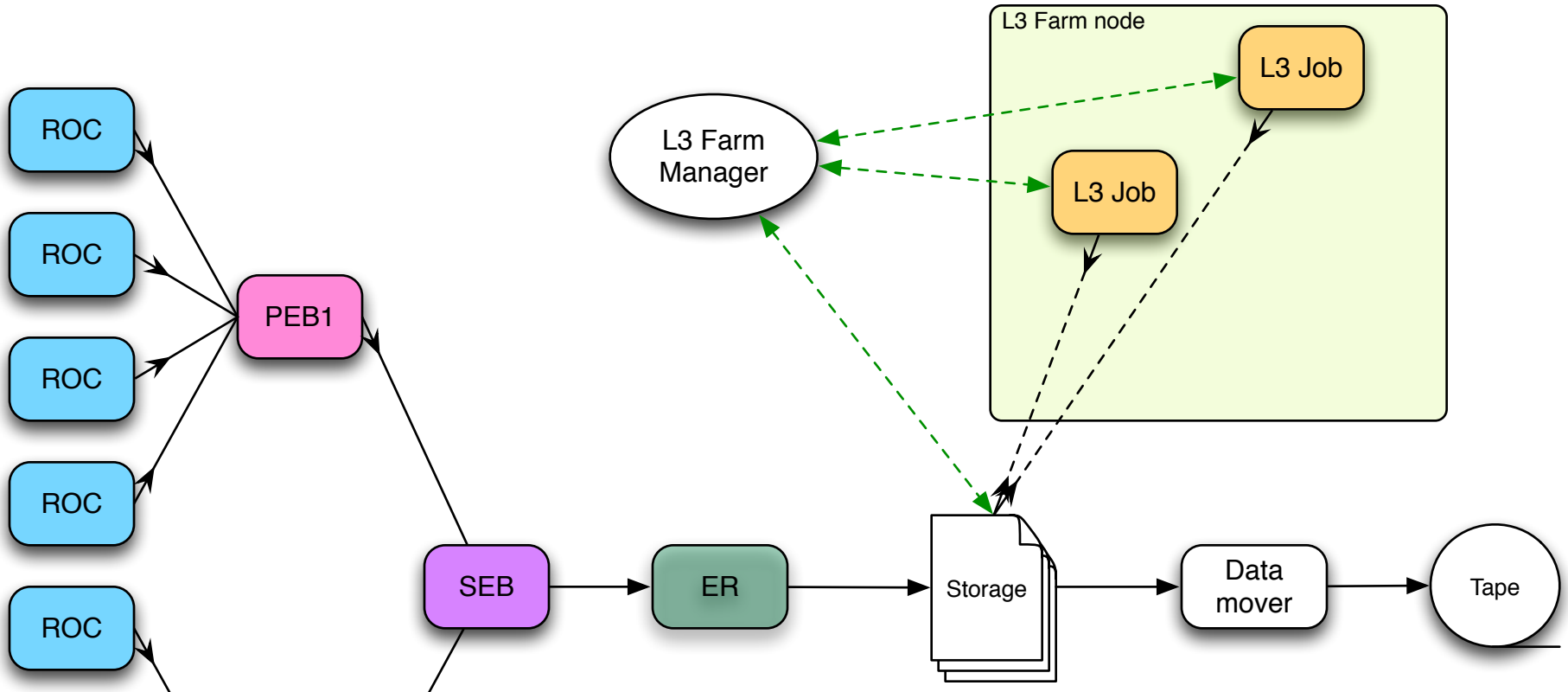
After filtering or monitoring the events are written to an ET. The ER picks up events from this ET and writes them to files on the networked file server.

In this scheme:
- The Farm Manager has to talk to the ER to tell it which node to put the next file on.
- The Farm nodes need to be available for data taking.
+ The Farm jobs don't have to be online for data taking.
+ The Farm nodes can provide a cheap and fast distributed disk buffer.
+ The L3 job reads from files which the same behavior as an offline job.
+ Run ends when all data in temp files.
- If the L3 farm fails the data may be stuck on the temporary files.



Deferred 2
The L3 Jobs could write directly to the network storage removing the need for an ET and ER.

- The Farm Manager is still required to tell the ER where to put the files.
- The Farm nodes still need to be available for data taking.
+ The Farm jobs don't have to be online for data taking.
+ The Farm nodes can provide a cheap and fast distributed disk buffer.
+ The L3 job reads from files which the same behavior as an offline job.
+ Farm jobs write directly to a file, same behavior as offline.
+ No ER needed after farm.
+ Run ends when all data in temp files.
- If the L3 farm fails the data may be stuck on the temporary files.



Deferred 3

At low luminosity, or with data compression and disentangling in the ROCs to lower the data rate the SEB or ER could write directly to the network file server.

+ The L3 Farm runs totally in offline mode with the Farm Manager monitoring directories on the disk.
+ Farm does not need to be running to take data.
+ L3 Farm can run 24/7 even if there is no beam for data taking.
+ L3 jobs behavior similar to offline jobs.
+ Run ends when all data on network storage.
+ No data lost if problem with L3 farm.

? Would need networked storage that can keep up with the unfiltered data rate.