ILC Controls WBS Costing for Computing

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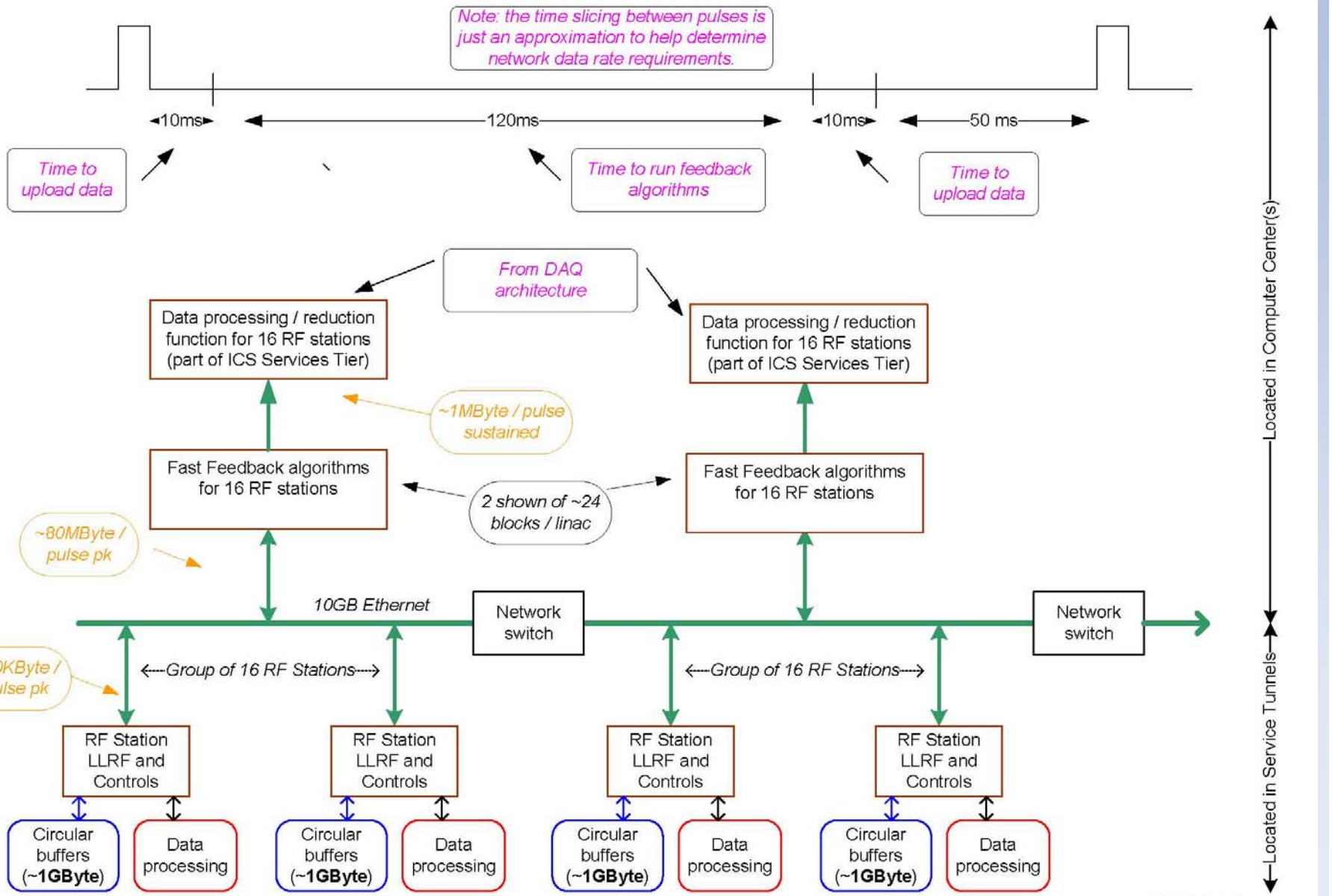
Costing Model Functional Diagram of Linac LLRF
Fast Feedback Control Loop (contribution from one linac only)



16 RF St

Notes from 5Hz Feedback

- Each RF station transfer 50Kb of data
  - Wave forms
    - RF Every pulse has 4 waveforms
    - each waveform has 3000 points (ie longwords)
  - Few Scalars
    - PS and RF
  - Data transfer must be guaranteed to occur in 10ms time slices. Rates during this slice are:
    - Single RF station: 5Mb/sec
    - Sector: 80Mb/sec
    - Single linac 2Gb/sec
- Single commodity computer/sector will be sufficient to process feedback algorithms
- Algorithm nodes will transfer data to the DAQ for archiving/monitoring

Central Computing

- for 1 Linac
  - 24 nodes for data archiving (1 per sector)
  - 24 nodes for fast feedback algorithms (1 per sector)
  - 50 nodes for monitoring/diagnostics (2 per sector)
- Additional sectors
  - 4 sectors/damping ring (ie, x3)
  - 4 sectors/source (ie, x2)
- Other Networking
  - General purpose (wireless in tunnel would be nice)
  - Streaming video
  - Timing
  - MPS (we don't cost)
- For complex
  - 50-100 nodes for central processing (some for "outside" controls network)
  - 512-1024 node linux farm for simulation
  - Data archiving (tape) for 0.5 Pb/year with a1PB disk cache.
  - Database
- Support Staff
  - 2 System Administrators
  - 2 Database Administrators
  - 1 Network Engineer
  - 1 Computer Security expert
  - 1-2 equipment tracking