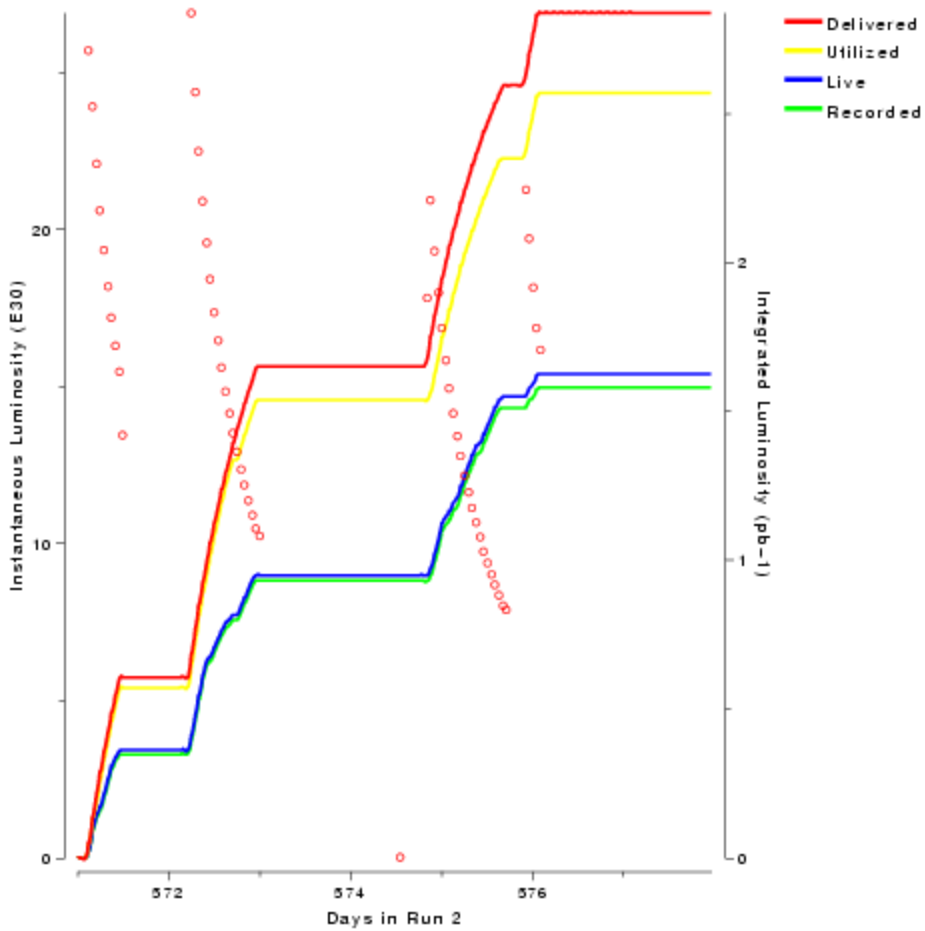
Week of September 23 to September 29 D0 Summary

- Delivered luminosity and operating efficiency
  - Delivered: 2.8pb^{-1}
  - Recorded: 1.6pb^{-1} (~60%)
- Data taking efficiency
  - no major hardware/software problems
  - lower, then typical
  - short stores have initial inefficiency
- Issues caused ~1+ hours downtime
  - Silicon readout and HV trips
  - CFT readout and downloads
  - Calorimeter SBC failure
  - Muon Level 1 trigger crate failure
  - Special runs
- Accelerator halo
  - reasonable
- Beam position
  - stable within 0.3mm from the detector center



Progress with Detectors/Triggers

- Experiment "timing change" happened during studies period last week
  - while Level 1 trigger decision is delivered to front-ends they are "holding" full information about an event in their memories
    - called "pipelines"
    - D0 Level 1 decision time is designed to be 3.6 microsec
  - at the beginning of Run II Level 1 decision time was set on a "lower side"
    - was "doable" without fiber tracker Level 1 trigger
  - after modifications to fiber tracker electronics/trigger
    - L1 latency was increased by 264ns
    - all detectors had to modify their timing (pipeline depth)
    - went reasonably smoothly
      - fiber tracker required 2 short accesses for firmware modifications
  - all systems performed timing change and verified operations
- Two major issues fixed in the muon system last week
  - Level 2 trigger code bug was fixed which drastically (factor of 50) reduced number of Level 2 code crashes
  - problems with muon readout crates accepting events while still processing previous one was resolved
    - muon data "integrity" problems are down to 10^{-5} level from 10^{-3} level
- Clear path for even higher trigger rates established
  - Level 1 trigger rate of 1kHz looks reasonable with no modifications
  - L2 trigger rate is planned to be increased to 0.5 kHz as soon as extra trigger nodes are "burned in"
  - this is starting to be very close to baseline Run II D0 design

Data Taking and Triggering

- Running physics trigger list 8.3
  - designed for luminosity in the range (5-40)10^{30}
  - keeping high p_t triggers un-prescaled at any luminosity
- After improving stability in trigger/DAQ over month we are able to set new trigger rates guidelines (~1.5-2 times above trigger version 8.2)
  - L1 trigger ~0.5kHz
  - L2 trigger ~0.2kHz
  - L3 trigger (to tape) ~50 Hz
- Total number of events collected over last week
  - 4mln
- Farms reconstruction progress and plans
  - burn in of the nodes on progressing on schedule
  - expecting considerable increase in reco farms reconstruction rate within ~2 weeks
  - Level 3 farms is awaiting 40 new nodes under burn in now - will ~double Level 3 trigger processing power

Calorimeter Preamplifiers Cooling

- Last week D0 lost cooling in one of the calorimeter preamp boxes
  - as a result temperature of the cooling air increased from 40degC to 69degC
    - close to klixon power shut off limit
    - affects preamps performance and lifetime
  - 3 sensors inside the box all measure elevated temperatures
  - affects ~4% of calorimeter channels
    - 12% of central calorimeter channels
- We tried multiple options to fix this issue without access
  - box is located in the "cathedral area"
  - turned power to preamps off
    - quick temperature reduction to 21degC
  - power cycled braker feeding power to fans - no change
- Most probably failure of the cooling fan(s)
  - all fans replaced for Run II
  - have had one similar failure last year
    - 2 fans failed
    - "bushing" style while labeled/ordered as "ball bearings"
- Repairs require major efforts
  - 4 hours each to open and close 1,000 tons muon magnets
  - 4-8 hours to disassemble box and replace failed fan(s)

Prototype Preamp Box

Summary

- D0 experiment is progressing well with physics data taking
  - trigger list 8.30 is running on-line
  - 4 mln events collected last week
- Weekly data taking efficiency over last month is stable at ~65% level
  - quite a few runs have efficiency above 90%
- Further increase in off-line data processing power as well as Level 1 and Level 2 trigger bandwidth is expected soon
- Failure of the cooling system for the calorimeter preamplifiers requires access
  - 12-16 hours in duration, including detector opening/closing
  - currently scheduled to start at 6am on Wednesday, October 2nd
    - expect to be ready for S&S between 6pm and 10pm
    - will provide better estimate about progress of repairs by noon Wednesday