Notes of the Scheduling Physicist

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RUN 2009

Scheduling

- Bring everybody to the same page
  - Collect requests, issues, jobs, etc. from all parties
  - Try to reach agreement between all the parties, if possible
- Develop schedule for a week
  - based on current priorities and best personal judgment
- Monday Scheduling Meeting is main tool to achieve this
  - timing seems to be right (but can be overwritten by Tue meetings)
  - SM serves its purpose only if taken seriously by everybody
    - 500 -> 200 transition: Agreed schedule 04/06-12 scrapped on Tue
    - STAR requested maintenance length estimate 2 weeks in advance, but frequently would object maintenance planning so early.
- Overall, SM went well and was very useful (01/26-06/26)
- *However, MCR, Sampson, etc. execute the schedule*

Communicating is a must

- SP is uniquely positioned in the system. He knows (at least, must know) of almost all operational aspects: priorities, detector requests, maintenance, etc.
- SP must be informed of all schedule changes and activities possibly affecting RHIC operations
- Failures to communicate caused aggravation
  - Access Control Group, starting before run (has been issue before)
  - not-filed and unapproved jobs caused long maintenance recovery ("we always did it")
  - Roman pots test was not well coordinated, tripped several stores
  - MCR had problems communicating to STAR people once they were in the tunnel. 30 min granted, no response for another hour. We could have done another repair job in parallel.
  - ***gradually improved through the run***
- Short RHIC accesses were handled by MCR very well

500 GeV run planning

- 500 GeV plan was too aggressive (unrealistic?)
  - develop uncharted 500 GeV territory
  - commission a great deal of new hardware
    - Linac front end, upgraded polarimeters at 250 GeV, LLRF, 9 MHz
  - get substantial physics data

in 3 weeks!

Somewhat contradictory to previous two

  - power supplies failures hindered the effort (surprise!)
  - because of new run, confusion with polarimeters, unavailability of the Jet, attempts to commission 9 MHz, and time lost due to PS failures and glitches the need to understand the machine collided with the need to run physics
  - *substantial effect on schedule and smooth physics running*

500 GeV run planning

- What should have been done, I think
  - Because it was a development run too, MD should have been distributed evenly over the run, e.g. 12h every Thursday *regardless* of physics progress
  - instead of occasional and lumped MD sessions
  - planned distributed MD would
    - give more time for MD studies (nothing comes free)
    - let everybody prepare for studies and think about results
    - allow for “smoother”, sustainable schedule
    - be more productive
    - make everybody’s (RC, SP, experiments) lives easier
  - MD does not have to be used if progress is fantastic

200 GeV Run Machine Development

- Run timeline:
  - Fast transition from 500 GeV to 200 GeV
  - Luminosity lifetime was shorter than before
  - Machine performed worse than expected (limited by B-B?) but reasonably well comparatively to previous years (when running)
  - After 5 weeks of running, a week was taken for MD
  - Supported by experiments (not a scheduling issue)
- My impression: MD was not well thought through
  - β^* = 70 cm -> 80 cm -> 100 cm -> 70 cm
  - No substantial improvement right after studies
- Starting MD earlier in the run and distributing MD (8h a week), until understanding comes, might have worked better
  - distributed approach let one to analyze data, think, and regroup
  - keep more sustainable schedule

Hardware commissioning

- Hardware installation/commissioning efforts can be underestimated, interfere with physics running.
  - CAD hardware installed and (being) commissioned
    - Linac front end (affected BLIP operations)
    - CNI polarimeters at 250 GeV (great deal of confusion)
    - LLRF (should have been spread over the run from the beginning)
    - 9 MHz (took too long although we knew it needs new LLRF)
    - spin flippers (commissioning took physics time, underestimated)
    - jump quads (extended a couple of maintenance days)
  - it takes time from physics, maintenance days, and APEX
  - *it is not easy to determine exact time needed, to be fair*
    - *best approach in this case: new commissioning plan has to be re-submitted and approved (or not) by all involved parties*
  - Include additional time in Run plans - or expect physics losses

Misc. notes
(legacy of SP 2009)

- Short-notice changes to schedule rarely work, can backfire
  - Studies need preparations, time is not used effectively
  - Hard to adjust APEX schedule
  - Detectors might have plans even for short stores
- Do not over-schedule: RHIC has it's own pace.
  - Bill knows when to turn on his magnet
- Let Paul Sampson and MCR arrange details of access
  - Just schedule, they will do the rest much better
- SP webpage was a complete failure on my side
  - visited from >900 different IP's. *The webpage is needed.*
  - KISS: schedule, scheduling meetings, time meetings, …
- Time meeting
  - Keep TM lean and mean
  - Reserve the Snyder room. Do not assume everybody is aware of TM.

Conclusions

- A great overall job was done by everybody during this run
- We did not have major scheduling problems, IMHO.
- **I did not have outstanding problems communicating with anybody within expected personal deviations.**
- Reasonable level of communication was achieved. Number of “stealth fighters” progressively decreased towards the end of the run.
- New development runs, like the 500 GeV, should include scheduled MD time independently of physics program. MD should be distributed over the run.
- Either run plans have to include realistic estimate of commissioning/development efforts or expect lost physics time
- We have to do something with hardware reliability…