



CMS Requirements for Computing

2015 Running Conditions

- CMS is currently operating on the assumption the machine will get to 25ns quickly
 - 50ns is very hard to deal with. Reconstruction times go up exponentially, and unless the plan changes we will have done the preparatory work (simulation and reco optimization for 25ns)
- We assume the machine will increase the lumi throughout the year
 - half at $1E34$ (25 interactions per crossing) and half at $2E34$ (50 interactions per crossing)
- We are using the estimate of 5M live seconds which we used for all three years of the first run. Was optimistic for 2010 and underestimated in 2012
 - Up for debate since it drives the number of events

Trigger rate

- CMS has used some assumptions in the early calculation for the trigger rate in 2015
 - Remembering we discovered a light particle and wish to keep thresholds low to maintain efficiency you end up with about 650Hz just in the triggers for datasets associated with the Higgs
 - Increases in cross sections and luminosity
 - Assuming we have the rest of the program you end up around 1.2kHz

Parameters that drive the request

- There are 3 assumptions that drive the request
 - Prompt Reconstruction - In the absence of parked data we need enough resources to reconstruct the data (At Tier-0 or spilling to Tier-1s)
 - We got big increases in the speed of the code, there probably aren't that size improvements left to find
 - Data Reprocessing - We estimate Tier-1 resources based on the ability to reprocess the data in 3 months
 - If we need resources for prompt reco there are less for this
 - MC - We estimate we will need to simulate between 1.3 and 1.5 times the number of data events collected
 - This has partially been motivated by capacity and partially by need

Unless there are changes

- Unless there are changes in the way the experiment works and the assumptions in the model, the Computing resources increase by about a factor of 2 for processing
 - We will collect as much data per year as we did in the first run
 - Some efficiency gains keep it from growing by a factor of 3
 - Working on improving the efficiency of disk storage
 - Tape increasing with trigger rate

Strategy

- We don't a big increase in 2014, we need a significant increase in 2015 and continued growth in 2016
 - We could propose increases in 2014 to improve the growth curve
 - We could also agree that we will approve the 2015 requests early and tell countries there is a target they need to get to in 2 years
 - Might improve the flexibility of how the resources are used.