Future strategy update: ATLAS

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In Run 3 we will use multi-threaded software to ensure we can continue to fully utilise resources as the number of cores per unit memory increases.

- Entails a large scale software development programme which is currently under way
  - Simulation with GeantMT is operational: technical issues being resolved
  - Parts of the reconstruction can also run multi-threaded: expanding the test suite to lead to validation in 2019

- Aim to run 50% of the simulation with FastCaloSimV2: validation under way
- Study group working to reduce disk footprint: preliminary recommendations expected early 2019
- Experimenting with reading AOD (bulk output of reconstruction) from tape
- Review of conditions conducted last year: Follow up in January - migration to a new RESTful interface ongoing
- Expect to need ~50% more capacity at the Tier0 (higher $<\mu>$), slightly higher trigger rate, partly offset by tuning tracking settings (e.g. hits on track)
Towards HL-LHC

- Waiting for technology improvements alone will not meet HL-LHC computing requirements
- Significant investment in software R&D will be needed before Run 4
- Accelerators (GPUs, FPGAs) are appearing as a major component of new machines
  - Adapting code to efficiently use these architectures is non-trivial
  - They are particularly well suited to training deep neural networks: can such techniques be applied to bulk data processing and simulation in HEP?
- Variety of initiatives in the US and Europe beginning to form (IRIS-HEP in US already recruiting)
ATLAS Preliminary
Disk resource needs
- 2017 Computing model
- 2018 estimates:
  - Baseline model
  - Reduced storage model
- Flat budget model (+15%/year)

ATLAS Preliminary. 2028 Disk resource needs
Baseline model

Run 2
Run 3
Run 4
Run 5

Year