

ATLAS Event Service in production. Highlights (1)

- Event Service in ATLAS: a fine-grained approach to event processing. Delivers events to the running payload application dynamically at run-time. Designed for exploiting diverse, distributed and potentially short-lived (opportunistic) resources.
- First use-case for the Event Service: ATLAS Simulation with Geant4
- Main platform for the development and commissioning of the Event Service so far: Supercomputers at NERSC (LBL, USA)
- Running production workloads at NERSC since late 2015
- Studied several factors affecting CPU efficiency of the Event Service on HPC compute nodes:
 - Payload initialization time
 - Sequential running of several instances of the payload on the same node
 - Handling of fine-grained outputs

ATLAS Event Service in production. Highlights (2)

- As part of the Event Service commissioning on HPC, studied the performance of the Object Stores
 - By adjusting the object size achieved 7.2 GiB/sec writing speed from ANL to BNL
- Lessons learned:
 - Primary causes of sub-optimal usage of CPU resources on HPC compute nodes by the Event Service are slow initialization of the payload and serial running of multiple instances of the payload on a single node
 - Large number of small transfers can saturate Object Stores
 - Prefer few large transfers to the Object Store to many small transfers
 - Data stage-out has to be decoupled from the event processing