

Introducing heterogeneous farms in the CMS high level trigger

Serena Ziviani

Università degli studi di Modena e Reggio Emilia

CERN Openlab Summer Student Programme



Supervisors: Luca Atzori, Felice Pantaleo



- High luminosity upgrade will increase the luminosity by a factor of 4
- Output rate of the level 1 trigger will go from 100 kHz to 750 kHz
- High level trigger need to increase its processing rate



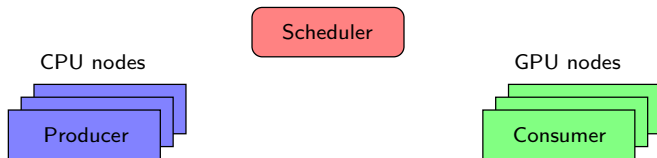
Introduce remote offload in CMSSW

- Run the trigger and reconstruction phases on an heterogeneous cluster
- Match each kind of computation to a better suited node
- Increase the number of events processed per unit of time



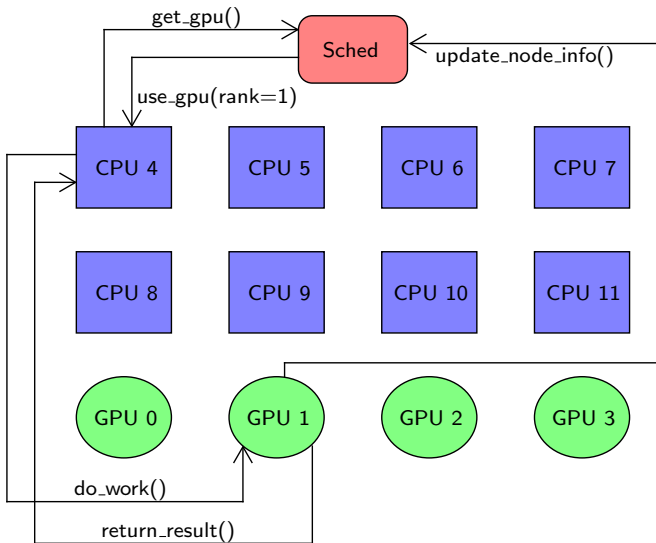
Create a standalone MPI + TBB application to study the communication protocol

- Three kind of nodes



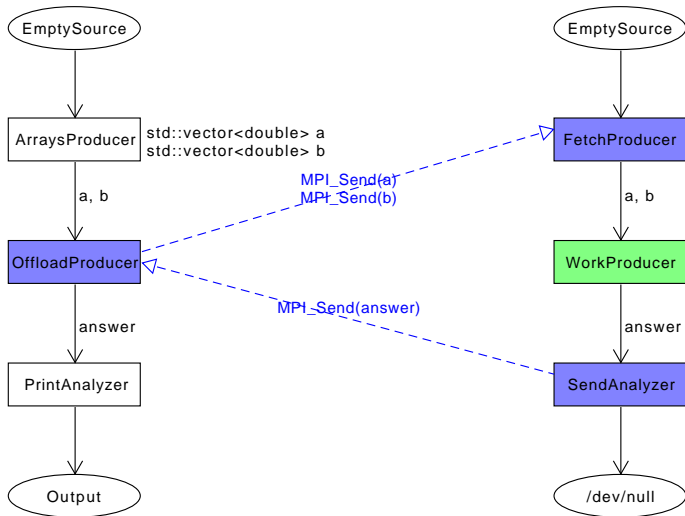
- https://github.com/sere/the_offloadinator

Communication protocol





- Transfer the communication protocol into CMSSW
- Execute two separate CMSSW paths under the same mpirun command
- Still work in progress
- https://github.com/sere/CMSSW/tree/mpi_core





- Benchmark the communication overhead over the performance gain
- Introduce a Scheduler path

Questions?