

WE START WITH YES, DATA

HEP-CCE I/O STRATEGIES INTRODUCTION

PETER VAN GEMMEREN

ROB ROSS

HEP-CCE/IOS



HEP-CCE/IOS: ACTIVITIES

Recall: What we do/did.

- **Darshan for ROOT I/O** in HEP workflows on HPC
 - **Shane** will show overview of the tool developments
 - **Rui** will present example studies of ATLAS Simulation and Derivation use-cases
 - For **Doug, Ken, Rob, Patrick**
- Investigate **HDF5 as intermediate event storage** for HPC processing
 - **Saba** will give a detailed presentation on this effort
 - For **Amit, Chris, John, Kyle, Peter, Suren**
- Investigate **HPC/GPU friendly data model** (joined with PPS)
 - **Amit** will show us the latest developments and an overview of experiments' efforts
 - For **Ken, Kyle, Peter** (plus **PPS**)
- Plus: **Liz, Philippe**, (and others, who haven't registered in the author list)

HEP-CCE/IOS: EXPERIMENT QUESTIONS, IOS

3. Are you familiar with HEP-CCE's I/O and storage (IOS) activities? These include
 1. an **experiment-agnostic mini-app** that mimics HEP application I/O patterns,
 2. measuring and understanding I/O patterns of HEP applications with **Darshan**, and
 3. an HPC-friendly **HDF5** mechanism to write HEP data originally serialized using ROOT I/O. Are these relevant to your I/O issues? Can you suggest other directions that will be useful for you?
- Our work activities: Saba, Rui and Shane will give details

HEP-CCE/IOS: EXPERIMENT QUESTIONS, IOS

What are we going to do?

4. The HEP-CCE IOS effort started two study groups dedicated to
 1. **HEP event data models** that are efficient for both disk I/O and accelerator offloading and
 2. "intelligent" **data compression** (domain-specific, guaranteed precision, and recoverable precision). Are these directions relevant to your experiment R&D plans? Are there other I/O projects that CCE should focus on?
 - Newer investigations, Amit will give details on 1. and Peter will mention 2.
5. There are R&D activities in the HPC and HEP communities on **Object Stores** (e.g., **HEPnOS**, **RNTuple/DAOS**). HEP-CCE IOS has relevant expertise in this area. Would you be interested in an “event object store” R&D activity?
 - Future activity, to be discussed tomorrow.