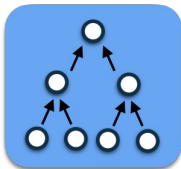


CompF1: Expalgo intro

- **Computational requirements** have grown rapidly in recent years, in particular resource needs from the experiments for analysis, processing
- HPC architectures provide **excellent opportunities** to satisfy some of the demands, however, for experimental algorithm development they also pose **key technology challenges**
- We discuss several approaches in the report to address these challenges:
 - Parallelization and optimization of **specific (time consuming) algorithms** that take full advantage of specific architectures
 - **Portability solutions**
 - Development and optimization of **common tools**
- Approaches need to be supported by the **Software frameworks** of the experiment

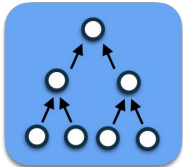


CompF1: Expalgo recommendations

[Draft Report](#)

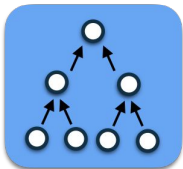
- Prepare for use heterogeneous computing platforms efficiently using portability tools and targeted optimizations.
- Support for software frameworks and common tools.
- Interdisciplinary collaborations and programs
- Training opportunities
- Career opportunities
- Human resource allocations beyond R&D phase to develop production-ready software.
- Long-term project support

Some of these items were needed in the past but there is more urgency to address them now.



CompF1: Expalgo post-meeting take-aways

- Main needed resource: experts in both experiment and computing
 - Investing in career development and recruitment is essential
 - Postdoc programs at HPC centers with career opportunities.
 - Standardized approaches for portability (even in C++ standard) may lower the bar for training/specialization of workforce
- Computing and the required resources need to be part of experimental design from inception
- Evaluation of improvements: speed-up/performance metrics are relevant but ultimately what matters is overall cost: hardware, electricity, salaries. And who is paying needs to be part of the equation (e.g., at HPC centers, experiments are not paying for the hardware).



CompF1: Expalgo post-meeting take-aways (continued)

- Should there be “project” funding similar to detector development?
 - Consideration: cross-experiment and cross-frontier development is desirable. Does “project” funding allow for this?
 - Detector project costs are mainly engineers. The same could be argued for computing projects and software experts.
- Should software development/funding be linked to a detector project?
- Common problems help co-design of computing architectures
 - needs big enough market to justify investment
- Roadmap of experimental computing should evolve and adapt to computing environment