

Porting ATLAS Software on Summit and Future Supercomputers

“Intel is the one killing off the X86 architecture for all but the basic control of data flow”
(from [*"INTEL'S EXASCALE DATAFLOW ENGINE DROPS X86 AND VON NEUMANN"*](#))

- **ATLAS Software can be ported to Summit by installation from source (see next slide for details)**
- **Advantages**
 - **Features trimmed to specific architecture**
 - **Hardware specific compiler flags adjustment**
 - **Maximum performance (no chipset emulation)**
- **Porting work continuity will help to assure that:**
 - **Effects on new architectures are considered in ATLAS software developments**
 - **ROOT, generators, LCG packages porting probed sooner**
 - **Validation procedures are well established**

ACSC (*ATLAS Comprehensive Software Compilation*) – addresses software porting needs for supercomputers

- First successful attempt to install ATLAS code together with externals on non-x86 architecture



IBM Power9 CPUs, GPUs, Linux
(ATLAS x86 binaries are not compatible)

ATLAS CODE

GAUDI
(software architecture)

ROOT (data
processing
framework)

Common HEP
software
tools

- Emulating a different chipset can result in huge performance loss
- **Solution:** install code and externals **from sources**
 - Same GNU Linux and compiler
 - Software and Physics validation

Proposals for Summit

- **ACSC production implementation**
 - **So far requirements gathered, design concept proven**
 - **Make master branch suitable for ACSC method**
 - *Important: make a high level decision to provide installation from sources for “key” ATLAS releases*
 - *Trials builds on non-x86 architectures, e.g. in OpenLab*
 - **Work with ROOT developers on needed tweaks for PowerPC**
 - **Set of scripts for automatic installation from sources**
- **PanDA integration with Summit**
 - **Initial integration done at Summitdev (e.g. adaptation of Harvester to local resource manager)**
- **Study of efficiency of ATLAS parallelization techniques (AthenaMT) on Summit architecture**