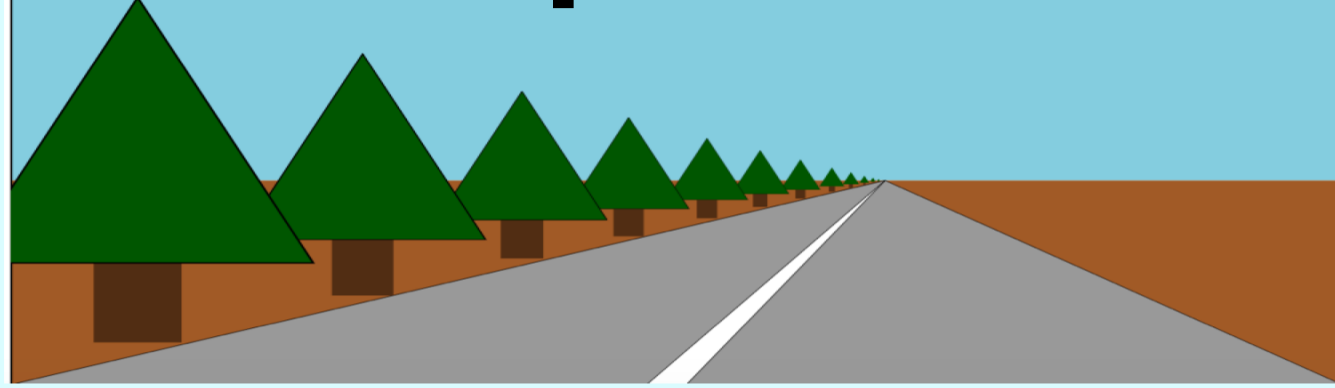


Perspective



ATLAS Data Processing

Currently uses Grid:
100,000 cores,
over 100 sites



FUTURE

PowerPC and High Performance Computers (HPC)



Develop methodology of ATLAS software installation from source code on PowerPC and HPC (together with external packages), applicable to new processors with different instruction sets

Task

ATHENA (ATLAS SOFTWARE)

GAUDI (CORE FRAMEWORK)

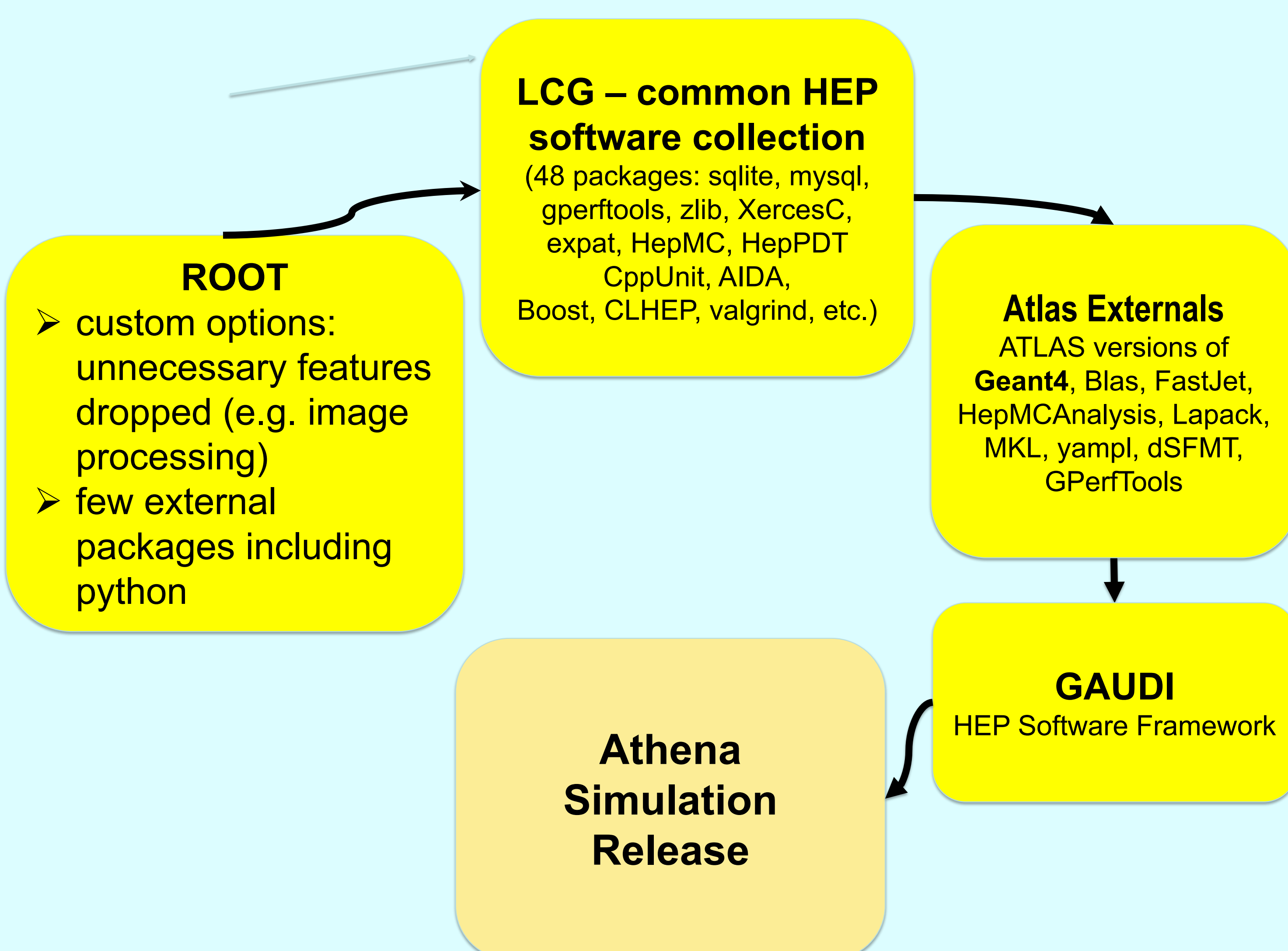
ATLAS EXTERNALS

LCG (common software for HEP)

ROOT

Method

- **Fully automated procedure**
 - Code upload via HTTP
 - Available for all external packages and Athena (ATLAS software) via git, wget
 - Distributed files systems such as CVMFS are not available on many supercomputers
 - Chain compilation ROOT-LCG-EXTERNALS-GAUDI-ATHENA
- **Athena (ATLAS software) simulation releases**
 - Simulation is one of the most CPU-consuming task in HEP
 - 1/5 of full ATLAS software (700,000 code lines)



Results

- **The fully automated installation procedure** for ATLAS software was successfully performed on Titan HPC and SummitDev PowerPC at Oak Ridge National Laboratory, and on x86 machine at CERN as a cross-check
- **Compilations (gcc 6.2, 6.3) - 100 % successful**
 - Compilation time 9 hours
- **Installations were validated** with unit tests and ATLAS Simulation production jobs
- Few tweaks on SummitDev were needed:
 - Replacement of `__linux` compiler macro with `__linux__`
 - Replacement of linker option `-Wl,-z,max-page-size=0x1000` as virtual addresses and file offsets for the 64-bit PowerPC processor family segments are congruent modulo 64 Kbytes (0x10000)
 - Removal of external checkpointing packages
 - Patch to ROOT Cling code generation mechanism (for different functions addressing modes on PowerPC) – reported to ROOT team

Conclusion

Large and complex HEP software packages were installed and validated on supercomputers from sources, without chipset emulation

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