



FULL ATLAS SOFTWARE RELEASES ON SUMMIT

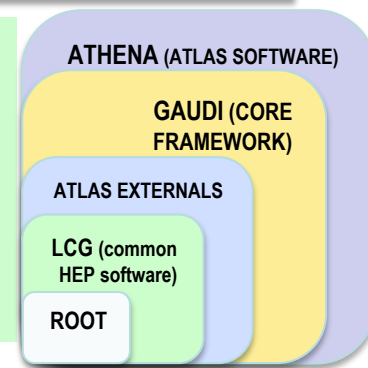
BIGPANDA TIM

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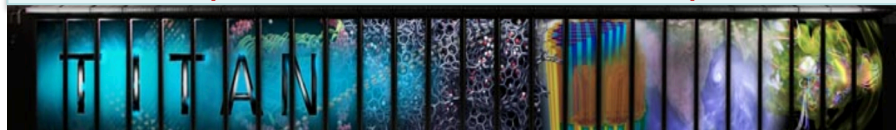
ACSC (ATLAS Comprehensive Software Compilation): From Simulation to Full ATLAS Release

After successful installation and testing of AthSimulation release 21.0.34 on Titan and Summit[Dev] the focus is on the full Athena release 21.0.31



- Full automation feasible: code upload via HTTP (no CVMFS)
- 2019 scope: Full Athena

Friendly Linux, AMD CPUs
(ATLAS kits binaries work)



PowerPC, 10X of Titan
IBM CPUs, GNU Linux
(ATLAS kits binaries do **not** work)



RESULTS

- Athena release 21.0.31 is installed on Summit on April 24
- One of major releases currently used in production. All included: simulation, analysis, physics analysis
- Few non-essential packages are bypassed (e.g. specifically using Intel architecture features)

Details (1/2)

- **Full Athena release is ~ 5 times bigger than an AthSimulation release**

	AthSimulation	Athena
ATLAS code lines	0.7	5
Files (ATLAS)	10000	50000
Externals packages	50	107
Generator versions	4	131
Total installation time (includes compilation)	8 hours	~ 1 day
Size needed for compilation, GB	~50	~250

Details (2/2)

- **Effort to install 21.0.31:** ~ 3 months x 0.3 FTE
 - 81 compilation reruns due to various reasons
 - Compilation options, flags tweaks
 - CMake files corrections
 - Code corrections (few packages were corrupted after corrections for public licensing)
 - Few cases of unreadable files on Alpine gpfs
 - All code and binaries on Alpine gpfs
 - Compilation jobs often stop after ~ 2 hours of execution
 - Compilation speed fluctuates (factor of 2)
 - E.g. very slow on April 20,21

Example of Code Correction

Fortran comment lines with “vector” word result in preprocessing errors. Example:

*! Contraction of a complex Lorentz **vector** in standard representation with itself*

Solution: replace “vector” with “vectorr” in fortran comments (~100 of instances)

Results

- **Full ATLAS release 21.0.31 is installed from source, successfully compiled, ready for tests**
- Exclusions:
 - *One package – usage of intel specific compilation flags*
 - *Hijing and Herwig3 generators (configure problems are not trivial)*
 - *Two packages of Forward Detector reconstruction (use header files of the unknown external package)*
 - *Four packages with unusual errors or external dependencies (no other packages depend on them)*
 - *DataQuality group of package with hardcoded dependence on AFS, CVMFS*
- **Rule adjustments for ATLAS release areas are suggested:**
 - No purge for ATLAS release area on gpfs (currently files can be purged after 90 days)
 - Allocate 250 GB high I/O NFS space for ATLAS release installation test
 - Interesting to compare with gpfs

Conclusion

- **US ATLAS proved that ATLAS software can be installed on Summit**
- **It is important to keep and develop unique (for ATLAS) multiplatform capabilities**
 - **Currently allocated 0.1 FTE for this purpose (WBS 2.4.2.2.4 “release installation tools”) is far from sufficient**
 - **Run 3 software brings a bigger and revamped code, uses new external tools, and therefore poses a challenge for multiplatform support**
 - **Smaller production-oriented releases could be a solution**
 - **BigPanDA librarian effort is necessary**
- **Further development of ACSC project depends on US ATLAS goal setting for Summit and future HPCs**