



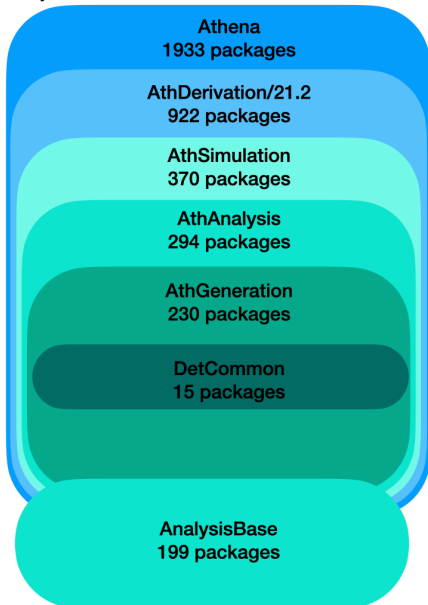
ATLAS SOFTWARE BUILDS

Johannes Elmsheuser

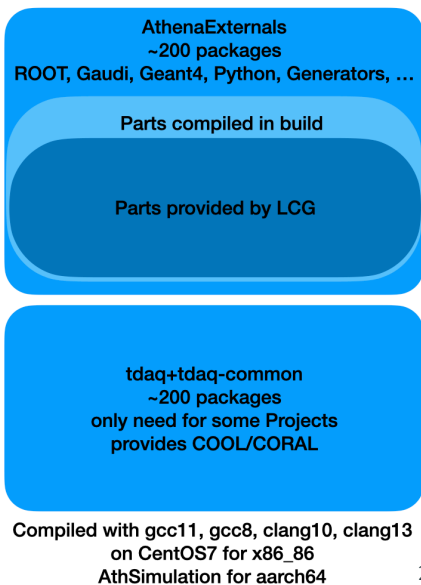
26 January 2022, ATLAS Google R&D meeting

ATLAS SOFTWARE SCHEMATIC OVERVIEW

Projects



Externals



SOFTWARE ATHENA BUILD TIMES

- A full ATLAS SW framework Athena nightly build starts in the evening CERN time and can take up to 10h until SW is available on CVMFS for direct world-wide access - subsequently many integration tests are started on the Grid (via the ART system on PanDA) which adds several hours in addition
- Every gitlab merge request (MR) runs a CI pipeline with incremental code builds, ctests and some local integration tests - takes 2-5h per MR
 - Shorter build times reduce the wait time for developers
- In addition: explore new architectures and compare Cloud infrastructure to existing CERN nodes

DIFFERENT INTEL AND ARM BASED RESOURCES FOR ATHENA BUILDS

- **aibuild16-042.cern.ch:**
 - Intel Xeon E5-2683 v4 (Broadwell), April 2016, 16 CPU cores, 120 GB RAM
- **techlab-arm64-thunderx2-01.cern.ch:**
 - Cavium ThunderX2 99xx, 256 CPU cores, 256 GB RAM
- **AmazonWebServices:**
 - ARM Neoverse Graviton, chose c6gd.4xlarge, 16 CPU Cores, 32 GB RAM, 300 GB EBS storage - larger/smaller EC2 setups configurable
 - Added CVMFS, no HepOSLib meta RPM package for ARM
→ installed missing RPMs by hand in try-and-error mode
- **Google:**
 - HPC VM image: c2-standard-30, 30 vCPU (Intel Cascade Lake), April 2019 or newer, 120 GB RAM, 250 GB SSD - larger/smaller setup configurable
 - CentOS 7.9, added CVMFS, HepOSLib meta RPM package, openssl
 - Increased default CVMFS size from 4 → 25 GB after weird python filesystem encoding errors during Athena compilation (also seen on x86_64 on AWS)
 - Did not try to install EOS fuse-mount to CERN - some Athena ctests use reference files from EOS

SOFTWARE BUILD TIME COMPARISON

Host	CPU	RAM [GB]	Project	Arch	Comp.	Type	Externals [min]	Config [min]	Compile [min]
aibuild20-37	20	60	AthSimulation	x86_64	gcc11	RelWithDebInfo	26	4.2	39
thunderx2	256	256	AthSimulation	aarch64	gcc8	RelWithDebInfo	15	5.8	27.7
AWS	16	32	AthSimulation	aarch64	gcc8	RelWithDebInfo	18	3.5	30.3
aibuild16-042	16	120	Athena	x86_64	gcc11	RelWithDebInfo	28	8.7	347
aibuild16-025	16	120	Athena	x86_64	clang10	RelWithDebInfo	42	6.7	274
aibuild16-027	16	120	Athena	x86_64	clang13	RelWithDebInfo	28	4.5	277
AWS	16	32	Athena*	aarch64	gcc8	Release	15.7	3.5	194
AWS	16	32	Athena*	aarch64	gcc8	RelWithDebInfo	19.5	4.3	258
AWS	16	32	Athena	aarch64	gcc11	Release	18.4	4.3	206
Google	30	120	Athena	x86_64	gcc11	Release	15.4	4.2	144
Google	30	120	Athena	x86_64	gcc11	RelWithDebInfo	16.7	3.1	182
Google	30	120	Athena	x86_64	clang13	RelWithDebInfo	19.0	3.2	135

- In some build on AWS Athena*: 6 package are disabled
- In addition: ctests/unit-tests, RPM and Website creation, CVMFS installation
→ adds up to ≈ 10 h total time until e.g. Athena release is on CVMFS
- Google HPC node looks good
- CERN nodes could benefit from hardware update