Benchmarking ATLAS applications

Franco Brasolin - INFN Bologna - <Franco.Brasolin@bo.infn.it>
Alessandro De Salvo – INFN Roma1 - <Alessandro.DeSalvo@roma1.infn.it>
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Outline

- ➢ **The ATLAS benchmark suite**
- ➢ **Benchmark execution**
- ➢ **Accessing the test results**
- ➢ **Conclusions and next steps**

The ATLAS benchmark suite

- **The goal is to define an ATLAS benchmark system, based on the experiment software**
  - **To have more realistic measurements of the CPU power, based on the experiment code and real jobs**

- **The ATLAS tests are based on an existing infrastructure**
  - **KitValidation**
  - **Global KitValidation portal**
    - https://pc-ads-01.roma1.infn.it/KV

The test infrastructure (1/2)

- **KitValidation (KV)**
  - **KitValidation has been developed to test the ATLAS software**
  - **It can execute custom tests, defined by the software developers and included in the experiment software releases**
  - **Used by the community since 2003 to test the ATLAS software installation**
    - Grid installation
    - End-user installation on desktops, laptops, …
    - Generic pre-release testing

- **Global KitValidation (GKV) portal**
  - **KitValidation is able to send the test results to a web service (GKV), if the corresponding feature is enabled**
  - **Few informations are sent to the portal**
    - Machine infos (CPU type, CPU speed, Memory size, …)
    - Test status (OK, FAILED)
    - Test logfiles and xml job info
  - **Through the GKV web interface search engine, the test results can be selected**
    - https://pc-ads-01.roma1.infn.it/KV

The test infrastructure (2/2)

- **The benchmark results are obtained by dynamically parsing the logfiles of the KV tests**
    - **Timings are obtained from the ATLAS software framework (Athena)**
    - **Using the Athena ChronoStatSvc timing service for full job timing**
    - **Using specific timers from the Athena routines, currently available only for G4 simulation**
    - **Almost no bias is introduced when using the framework timing services**
        - The ChronoStatSvc is measuring the actual job running time, excluding the basic initialization and finalization of the framework
        - Specific timing services can be added to fine tune the measurements

- **The benchmark results are collected in GKV**
    - **All users can view the benchmask results**
    - **Only power users have full access to the informations contained in the GKV pages, using their personal certificate**

Benchmarks execution

- **The test execution is performed by using a script**
  - **https://pc-ads-01.roma1.infn.it/KV/sw-mgr**
  - **The sw-mgr script is able to**
    - Install and test a specific ATLAS software release
    - Test an existing ATLAS software installation
  - **Multiple concurrent tests are also possible, with and arbitrary number of threads**
    - Useful when testing multi-core, multi-CPU machines at full load
  - **Example of a test of the existing installation of release 14.0.0 at CERN**
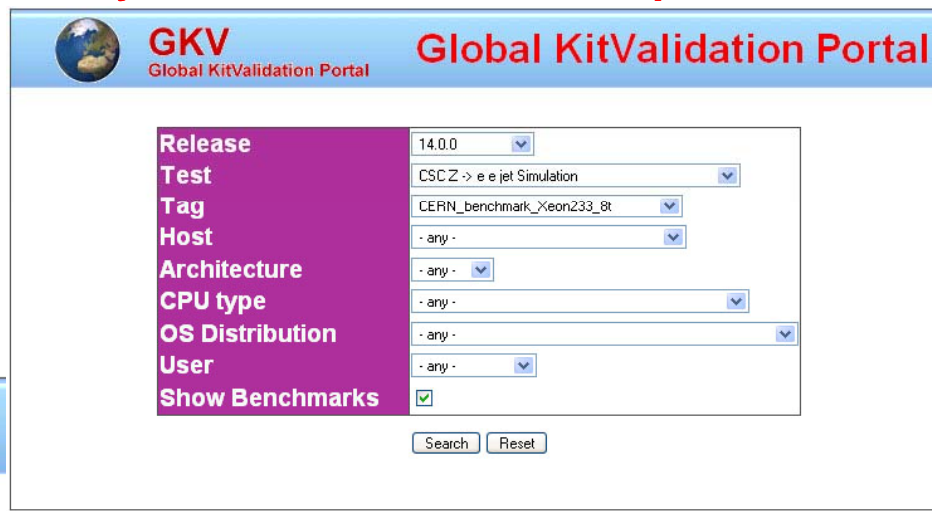
```
> VO_ATLAS_SW_DIR=/afs/cern.ch/project/gd/apps/atlas/slc3
> sw-mgr --test 14.0.0 -l $VO_ATLAS_SW_DIR/software/14.0.0 \
    -p $VO_ATLAS_SW_DIR/prod/releases/rel_14-0 -o -P AtlasOffline \
    -T release -t _i686_slc4_gcc34 -O opt -m 3.24 \
    --no-tag --tthreads 4 --kvpost --kvpost-tag "CERN_benchmark_AMD22_4t"\
    --kv-cache http://classis01.roma1.infn.it/pacman/test/cache
```

- **Every user is allowed to perform such tests and publish the information to the GKV portal**

Accessing the test results

■ **The test results may be browsed via the GKV portal**

lxbench01	Intel(R) Xeon(TM) CPU 2.80GHz, 2 GB RAM
lxbench02	Intel(R) Xeon(TM) CPU 2.80GHz, 4 GB RAM
lxbench03	Dual Core AMD Opteron(tm) Processor 275
lxbench04	Intel(R) Xeon(R) CPU 5150 @ 2.66GHz
lxbench05	Intel(R) Xeon(R) CPU 5160 @ 3.00GHz
lxbench06	Dual-Core AMD Opteron(tm) Processor 2218
lxbench07	Intel(R) Xeon(R) CPU E5345 @ 2.33GHz

Preliminary Benchmarking Results for ATLAS

- **Preliminary results obtained by running with release 12.0.6 (SLC3, gcc 3.2.3, 32 bits) over different processors at CERN**

ATLAS vs. SPEC
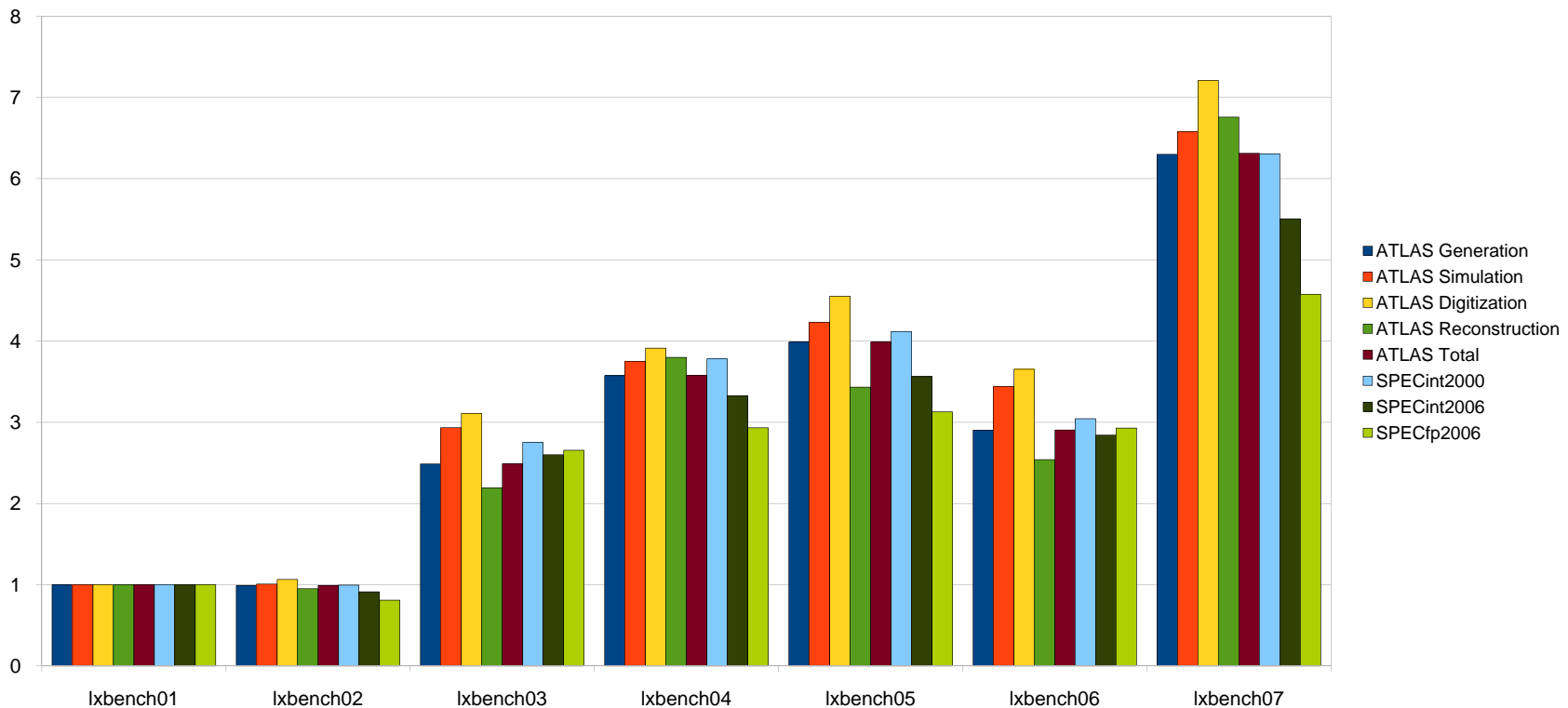
Conclusions

- **The ATLAS benchmarking suite is in place and functional**
    - **All the results are available from the GKV portal**
        - https://pc-ads-01.roma1.infn.it/KV
    - **Every user may contribute to the tests, even if non ATLAS people, by simply wget-ing the test script and executing it**
    - **An initial set of tests has been defined and performed on several architectures, both in SLC3 compatibility mode (release 12.0.6) and in SLC4 native mode (release 14.0.0)**
    - **The preliminary results are encouraging but still some work needs to be done (see below)**

- **Next steps and improvements**
    - **Provide more user-friendly pre-compiled scripts and examples to run the benchmarks for non-ATLAS users**
    - **Add to GKV the feature of presenting the summary of the benchmark sessions**
    - **Define a final set of tests to be performed in the benchmark sessions**
        - It would be highly desirable to have a compatible set of test (physics channels) among the experiments, if possible