Releases and nightlies validation

Rafał Pachołek
30 May 2018, CERN

Why do we need it?

- Test if required functionality is working in custom installations
- Test if numerical software gives the same result
- Test if new versions of packages break other packages

Current status: LCGTest

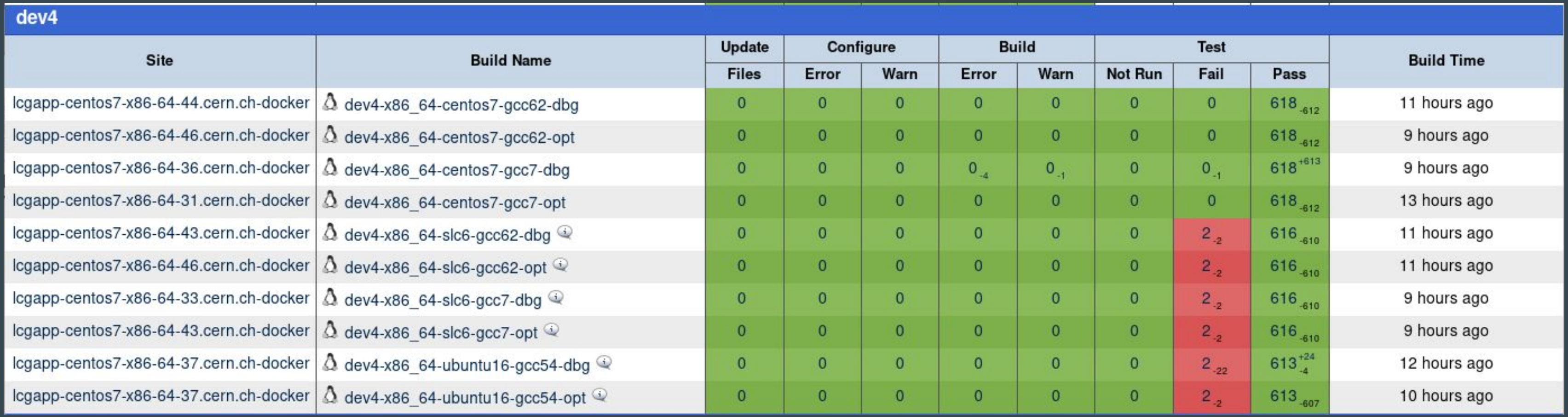
- Based on LCGCmake test macros
- Uses CTest as test framework and sends the information to CDash
- Checks the correctness of the software in the view
- Divides build scripts from test scripts
- Builds and tests are independent tasks

LCGTest usage

- LCG_add_test(python_test_preinstalled_modules
  TEST_COMMAND python test_preinstalled_modules.py)
  - python_test_preinstalled_modules: python test_preinstalled_modules.py
- LCG_add_templated_tests($1_$2_import_test
  FILEPATH pymodules.gen
  TEST_COMMAND python -c "import $2" LEVEL 2)
  - tensorflow_tensorflow_import_test: python -c “import tensorflow”
  - future_libfuturize_import_test: python -c “import libfuturize”
- LCG_add_multiple_tests(tensorflow_$1 WILDCARD python *.py)
  - tensorflow_example1.py: python example1.py

Current tests in LCGTest

- Not empty installation
- Python module test
- Python build-in module test
- Check python module dependencies



dev4

Site	Build Name	Update	Configure		Build		Test			Build Time
		Files	Error	Warn	Error	Warn	Not Run	Fail	Pass	
lcgapp-centos7-x86-64-44.cern.ch-docker	dev4-x86_64-centos7-gcc62-dbg	0	0	0	0	0	0	0	618_{-612}	11 hours ago
lcgapp-centos7-x86-64-46.cern.ch-docker	dev4-x86_64-centos7-gcc62-opt	0	0	0	0	0	0	0	618_{-612}	9 hours ago
lcgapp-centos7-x86-64-36.cern.ch-docker	dev4-x86_64-centos7-gcc7-dbg	0	0	0	0_{-4}	0_{-1}	0	0_{-1}	618^{+613}	9 hours ago
lcgapp-centos7-x86-64-31.cern.ch-docker	dev4-x86_64-centos7-gcc7-opt	0	0	0	0	0	0	0	618_{-612}	13 hours ago
lcgapp-centos7-x86-64-43.cern.ch-docker	dev4-x86_64-slc6-gcc62-dbg	0	0	0	0	0	0	2_{-2}	616_{-610}	11 hours ago
lcgapp-centos7-x86-64-46.cern.ch-docker	dev4-x86_64-slc6-gcc62-opt	0	0	0	0	0	0	2_{-2}	616_{-610}	11 hours ago
lcgapp-centos7-x86-64-33.cern.ch-docker	dev4-x86_64-slc6-gcc7-dbg	0	0	0	0	0	0	2_{-2}	616_{-610}	9 hours ago
lcgapp-centos7-x86-64-43.cern.ch-docker	dev4-x86_64-slc6-gcc7-opt	0	0	0	0	0	0	2_{-2}	616_{-610}	9 hours ago
lcgapp-centos7-x86-64-37.cern.ch-docker	dev4-x86_64-ubuntu16-gcc54-dbg	0	0	0	0	0	0	2_{-22}	613^{+24}_{-4}	12 hours ago
lcgapp-centos7-x86-64-37.cern.ch-docker	dev4-x86_64-ubuntu16-gcc54-opt	0	0	0	0	0	0	2_{-2}	613_{-607}	10 hours ago

Limitations of current LCGTest

- Extending CTest means writing mostly in cmake script most likely from scratch
- No integration with other test frameworks
- Only fail or pass status for test
- Complicated to implement package module testing

Future: Avocado?

- Developed by RedHat
- Set of tools and libraries to help with automated testing
- Native tests are in Python, but any executable can serve as a test
- Plugins that can extend and add new functionality
- Possibility of reusing existing unittest/other tests
- Multiple result formats
- Reproducibility of the test results

Requirements for testing framework

- Platform and package manager independent
- Assume software consists of modules that are optional
- Test parameters set by test developer, environment set by tester
- Test might be valid only for a specific version of package
- Easy reuse of existing tests

Test repositories

- Test available in repository
- Repository managed by project
- Configuration for the pkg environment

- Configuration file generated on build time
- Configuration as part of release
- Appending own test
- Using subset of provided tests

```
repositories:
        - gitlab.cern.ch/sft/testrepo
tests:
        - pkgname: python
          version: 2.7.13
          env:
                PATH: /path/to/soft:$PATH
          modules:
                - buildin
---- # A next test group might be appended
repositories:
        - github.com/root/roottest
tests:
        -   pkgname: ROOT
```

Single package test

- Manifest file describing package name, version and modules
- Test can be written in python or shell
- Tests are discovered and named after the filename
- Modules by directory structure
- Modules must always contain check function
- Single package contains pre- & post-scripts

Plans for testing LCG

- Problem-driven tests
- Requirement-driven tests
- Cooperation with users and developers to provide tests