Update on CI test suite deployment

LArSoft Coordination Meeting

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Testing the CI regression test suite

CI regression test suite tested on Jenkins system:

- Tested the MicroBooNE CI test suite.

- Found some issue.

- Reorganized the CI test suite to run on Jenkins system.

- Performances of the CI test suite on Jenkins system.

LArSoft CI regression test suite

- **CI regression test suite implemented for:**
  ArgoNeuT, DUNE35T, LArIAT, MicroBooNE, SBDN.
  - The code is published in the feature branch
    feature/vdb_ci_regression_test_suite for each experiment repository.
- **Implementation details:**
  - The CI regression test runs all the stages of the experiment work-flow.
  - Runs updated/modified code to generate "current" data files.
  - Use official FHiCL files with some option added to handle the random seed for the CI test.
    - Use fixed seed and/or read seed from an external file to ensure data production reproducibility (not always possible!).
  - Compare "current" data files against "reference" data files generated for this purpose.
    - Reference files are located on the experiment scratch dCache area.
- If a new data products is included in the output, this will introduce a possible back-incompatibility. It is required a mechanism to automate the procedure to switch to new reference data files.

Found some issue

- **Using the *inputfiles* field in ci_tests.cfg prevent the tests in the CI test suite to run in parallel.**

- **Running the tests I got two false negative.**

- **Both issues have been fixed by Marc Mengel.**

- **MicroBooNE reconstruction stage1 looks like is not reproducible (random seed not proper used in some of the producers?). The experiment has been informed.**

Reorganize the CI test suite

- **The test of the official generation stage require flux files for genie.**
  - **These files are located on the experiment Bluearc area that isn't available on Jenkins system.**

- **The genie configuration has been modified:**
  - **for the CI test now it uses an histogram.**

Performances of the CI test suite on Jenkins

lar_ci Jenkins display for the tested CI test suite

Build	Start Time	Platform	checkout	build	make_test	install	ci_tests
lar_ci_beta/1626	2015-11-16 10:38:42.218316	Linux 2.6.32-573.3.1.el6.x86_64	●	●	●	●	●

The full chain of the Jenkins build takes about 1h.

stage	checkout	build	make_test	install	ci_tests	TOTAL
Time (min)	2.16	10.96	22.34	8.68	13.74	**57.88**

- **CI test suite runs 6 tests in parallel:**
  - **on Jenkins buildmaster the CI test suite runs in about 14 minutes.**
  - **on MicroBooNE GPVM (4 cpus) the CI test suite runs in less than 5 minutes.**

- **The factor 3 in performances is under investigation.**

Summary

CI test suite deployment status:

- CI regression test suite for MicroBooNE tested on Jenkins system.

- Some issue found and fixed.

- Some change in the CI test implementation to take into account the Jenkins system environment.

- Low performance on Jenkins system require some investigation.

Backup slides

CI test implementation details

Test example:

srcs/uboonecode/test/ci/ci_tests.cfg excerpt

```
[DEFAULT]
STEPS = none gen geant detsim reco1 reco2 ana
LARSOFT_REFERENCE_VERSION=v04_20_00
BASEFILENAME=prodgenie_bnb_nu_cosmic_uboone
EXPCODE=uboonecode
EXPSCRIPT=ci_regression_test_uboonecode.sh
INPUTFILEDIR=/pnfs/uboone/scratch/users/vito/ci_tests_inputfiles
```

Experiment specific configuration

```
[test ci_gen_regression_test_uboonecode]
script=${UBOONECODE_DIR}/test/%(EXPSCRIPT)s
STEP=1
NEVENTS=1
args=%(NEVENTS)s %(STEP)s %(LARSOFT_REFERENCE_VERSION)s %(BASEFILENAME)s %(EXPCODE)s %(STEPS)s
inputfiles=%(INPUTFILEDIR)s/%(BASEFILENAME)s_Reference_gen_%(LARSOFT_REFERENCE_VERSION)s.root %
(INPUTFILEDIR)s/GenRandomSeeds_Ref.dat
parse_art_output=True
mem_usage_range=100:20000000
cpu_usage_range=10:60000
...
```

CI test section

```
[suite quick_test_uboonecode]
testlist=ci_gen_regression_test_uboonecode ci_geant_regression_test_uboonecode
ci_detsim_regression_test_uboonecode ci_reco1_regression_test_uboonecode ci_reco2_regression_test_uboonecode
ci_ana_regression_test_uboonecode
```

CI test suite section

- **The script to run the test is the same for all experiments.**
- **The "experiment specific section" in the ci_tests.cfg sets all required input to properly initialize the script.**
- **The "CI test section" sets further arguments for the specific CI test.**
- **The "CI test suite section" collects a list of tests to run all together.**

CI regression test statistics

Experiment	qualifier	stage	Time (min)	Memory (Mb)
MicroBooNE	prof v04_14_00	prodgenie	2:04	591
		g4	2:36	1665
		detsim	0:59	1190
		reco1	1:13	1338
		reco2	1:55	1410
		analysis	0:47	1410
	prof v04_22_00	prodgenie	2:15	609
		g4	2:53	1840
		detsim	1:17	1392
		reco1	1:35	1464
		reco2	2:46	1506
		analysis	0:56	1508

Tests executed on uboonegpvm03

- Simulated a ~1.8GeV ν_μ interaction with cosmic rays.
- MicroBooNE code uses similar resources in both LArSoft releases.
- Each test runs well within the target time upper limit (10 min)

CI regression test statistics

Experiment	qualifier	stage	Time (min)	Memory (Mb)
DUNE35T	prof v04_14_00	prodantimu	0:09	89
		g4	0:18	336
		detsim	0:13	164
		reco	0:15	252
		analysis	0:27	4543
	prof v04_22_00	prodantimu	0:09	89
		g4	0:13	215
		detsim	0:13	152
		reco	0:27	329
		analysis	0:14	7664

Tests executed on lbnegpvm03

- Simulated a ~1.6 GeV single $\bar{\mu}$ interaction.
- DUNE35T code uses similar resources in both LArSoft releases.
- Each test runs well within the target time upper limit (10 min)

CI regression test statistics

Experiment	qualifier	stage	Time (min)	Memory (Mb)
LArIAT	prof v04_14_00	fragment	0:11	204
		reco	0:16	211
	prof v04_22_00	slicer	0:14	165
		beamlinereco	0:09	101
		reco2D	0:12	134

Tests executed on lariatgpvm03

- Procesed 1 real data event taken at FTBF, MCenter beamline, 16GeV beam.
- LArIAT changed FhiCL files between v04_14_00 and v04_22_00.
- Each test runs well within the target time upper limit (10 min).

CI regression test statistics

ArgoNeuT and SBND FHiCL files used for this CI test are splitted to allow independ checks for each simulation step

Experiment	qualifier	stage	Time (min)	Memory (Mb)
ArgoNeuT	prof v04_14_00	sim	1:33	682
		reco	0:08	190
	prof v04_22_00	gen	1:29	636
		geant	0:13	140
		detsim	0:09	101
		reco	0:10	192

Tests executed on argoneutgpvm03

- Simulated a ~2GeV ν_μ interaction.
- ArgoNeuT uses similar resources in both LarSoft releases.
- All tests run well within the target time upper limit (10 min).

Experiment	qualifier	stage	Time (min)	Memory (Mb)
SBND	prof v03_08_02	sim	2:07	540
		reco	0:35	713
	prof v04_00_00	gen	0:13	87
		geant	2:06	364
		detsim	0:14	278
		reco	Not Available	Not Available

Tests executed on lar1ndgpvm01

- Simulated a ~2GeV single μ interaction.
- SBND uses similar resources in both LarSoft releases.
- All tests run well within the target time upper limit (10 min).
- reco stage can't run because of some issue, reco statisctic not yet available.