The test farm and its evolution

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UCLouvain
Institute of Condensed Matter and Nanosciences

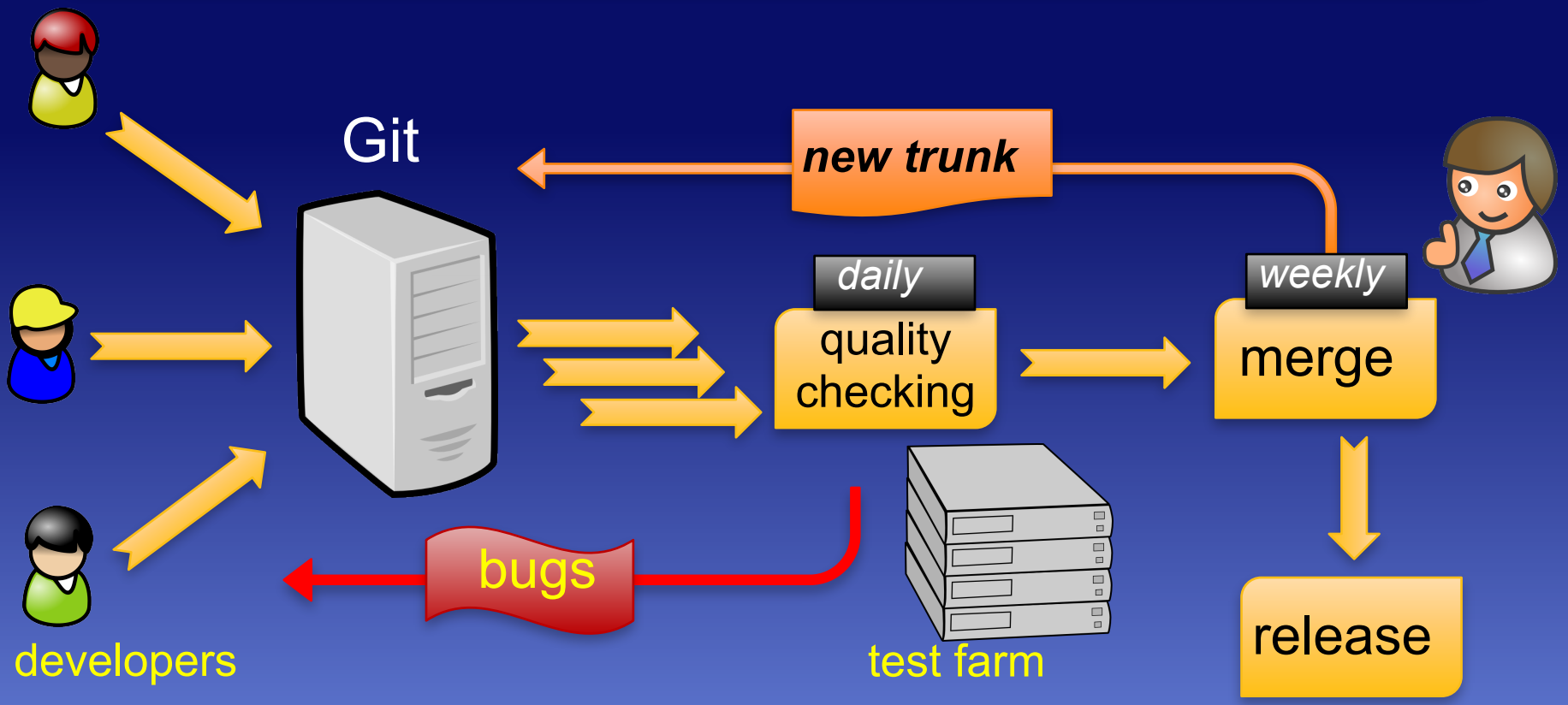
Outline

- Quick reminder concerning buildbot infrastructure
- Current state of test farm (update since LLN 2019)
- Overview of BBportal
- Upgrading the infrastructure

How to maintain code integrity despite numerous modifications (including bug insertion) ?

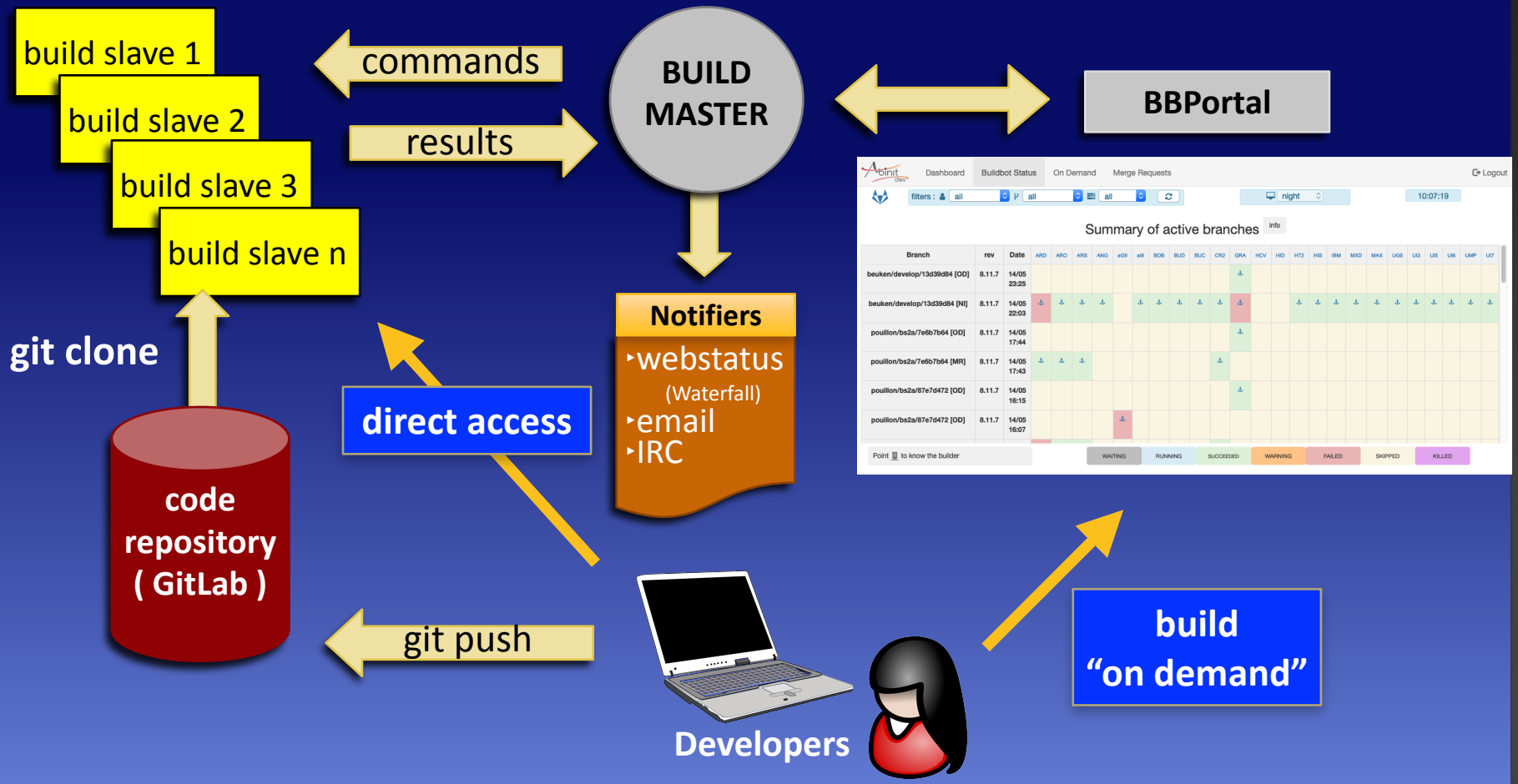
By applying the principles of Continuous Integration (CI)

- maintaining of code repository with a Version Control System (VCS)
- daily reviewing and, at least, weekly merging of contributions
- using of extensive test suites for reliability and portability
- automating the build and the tests with a computer test farm



Buildbot in Action

- When a merge requests are submitted to GitLab, **buildbot** start the builds.
- Developers have also the ability to start jobs "on demand" via a form on the portal
- The developer can access to the buildslaves by ssh for debugging in correct env.



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Name	Brand	CPU / Freq (Ghz)	# cores (#TH)	RAM Gb	OS
abiref	HP DL360 G9	Xeon E5-2670v3 / 2.3	2 x 12 (48)	32	CentOS 7.9
alps	**HP DL360 G10**	**Xeon Gold 6230 / 2.1**	**2 x 20 (80)**	**64**	**CentOS 8.3**
atlas	Supermicro	Xeon E5-2623v4 / 2.6	2 x 4 (16)	64	CentOS 7.9
bob	Dell R430	Xeon E5-2603v3 / 1.60	2 x 6 (12)	8	Fedora 23
buda2*	Supermicro	Xeon Silver 4110 / 2.7	2 x 8 (32)	16	CentOS 7.8
graphene	Apple MacPro	Xeon E5-2697 / 2.7	1 x 12 (24)	64	macOS 10.15.4
higgs	HP DL 360 G8	Xeon E5-2440 / 2.4	2 x 6 (24)	32	Ubuntu 18.04
max2	HP DL185 G7	AMD Opteron 6140 / 2.6	2 x 8 (16)	12	SLinux 6.10
scope	**HP DL385 G10**	**AMD EPYC 7502 / 2.5**	**2 x 32 (128)**	**96**	**Ubuntu 18.04**
ubu	HP DL360 G9	Xeon E5-2670v3 / 2.3	2 x 12 (48)	32	Ubuntu 16.10

* buda2 is equipped with 3 GPU cards : 2 x K40c and TITAN V

Removed servers since LLN 2019 : cronos2, cronos, ibm8

Name	Compiler	MPI	MATH	misc
abiref_intel_19.1_mpich	intel 19.1	MPICH 3.3.1	mkl 2020	many services
alps_nag_7.0_openmpi	NAG 7.0	Open MPI 4.0.4	NetLib 3.9	
alps_gnu_9.3_openmpi	**GNU 9.3**	**Open MPI 4.0.4**	**OpenBLAS 0.3.10**	**Reference**
alps_gnu_9.3_serial	GNU 9.3		OpenBLAS 0.3.10	**Ref for serial**
atlas_intel_18.0_openmpi	INTEL 18.0	Open MPI 3.0.1	mkl 2018	
atlas_intel_19.1_bdir	INTEL 19.1	Open MPI 3.3.2	mkl 2019	build/ dir
bob_gnu_7.5_openmp	GNU 7.5		atlas 3.10	OpenMP n=2
buda2_gnu_8.2_mpich3	GNU 8.2	MPICH 3.2.1	mkl 2017	
buda2_gnu_8.3_cuda	GNU 8.3	Open MPI 3.1.4	mkl 2017/magma	**Ref for cuda**
buda2_intel_17.0_openmpi	INTEL 17.0	Open MPI 4.0.4	mkl 2017	-finit=nan
graphene_gnu_9.3_macports	GNU 9.3	Open MPI 4.0.1	OpenBLAS	MacPorts
higgs_intel_19.0_serial	INTEL 19.0		mkl 2019	
max2_gnu_6.5_mpich	GNU 6.5	MPICH 3.3.2	ACML 6	memory leak
scope_gnu_10.2_paral	GNU 10.2	MPICH 3.3.2	OpenBLAS	**Ref for tparal_24**
scope_gnu_7.5_dep	G NU 7.5	MPICH 3.3.2	OpenBLAS	check dependency
ubu_gnu_9.2_openmpi	GNU 9.2	Open MPI 4.0.2	mkl 11.3	
ubu_intel_16.0_mpich	INTEL 16.0	MPICH 3.3.2	mkl 11.3	BigDFT
ubu_intel_16.0_openmp	INTEL 16.0		mkl 11.3	OpenMP n=2

“debug” builder : “many services”

Name	Compiler	MPI	MATH
abiref_gnu_9.2_debug	GNU 9.2	OpenMPI 4.0.3	OpenBLAS 0.3.7

- checks build system with less used options (e.g. openmp, exports, cclock)
- checks doc in sources (ROBODoc)
- tests “make parents”
- tests “make distcheck” (tarball creation)
- checks 15 abirules (rules for developers)
  (for ex: “Unused variable”, “Unused dummy argument”, "Nonstandard type declaration”, …)
- checks 10 buildsys (“check-build-examples”, “check-cpp-options”, “check-libpaw”, …)
- checks to find the broken links in docs with linkchecker

This set of builders (19) is called "nightly"
For the tested contribution to be integrated into trunk, all tests on “nightly" builders must be successful…

Name	Compiler	MPI	MATH	misc
higgs_gnu_7.3_cov	GNU 7.3	MPICH 3.2.1	MKL11/FFTW3	coverage
scope_gnu_10.2_s64	GNU 10.2	MPICH 3.3.2	OpenBLAS 0.3.10	tutoparal with np=64
alps_intel_21.2_elpa	**oneAPI 21.2**	**intel mpi**	**mkl 2021.2**	**elpa 2020.11 scalapack**
higgs_gnu_7.5_triqs2	**GNU 7.5**	**MPICH 3.2.1**	**Netlib**	**TRIQS 2.x**

- GNU <= 5 and IBM xlf are no longer supported

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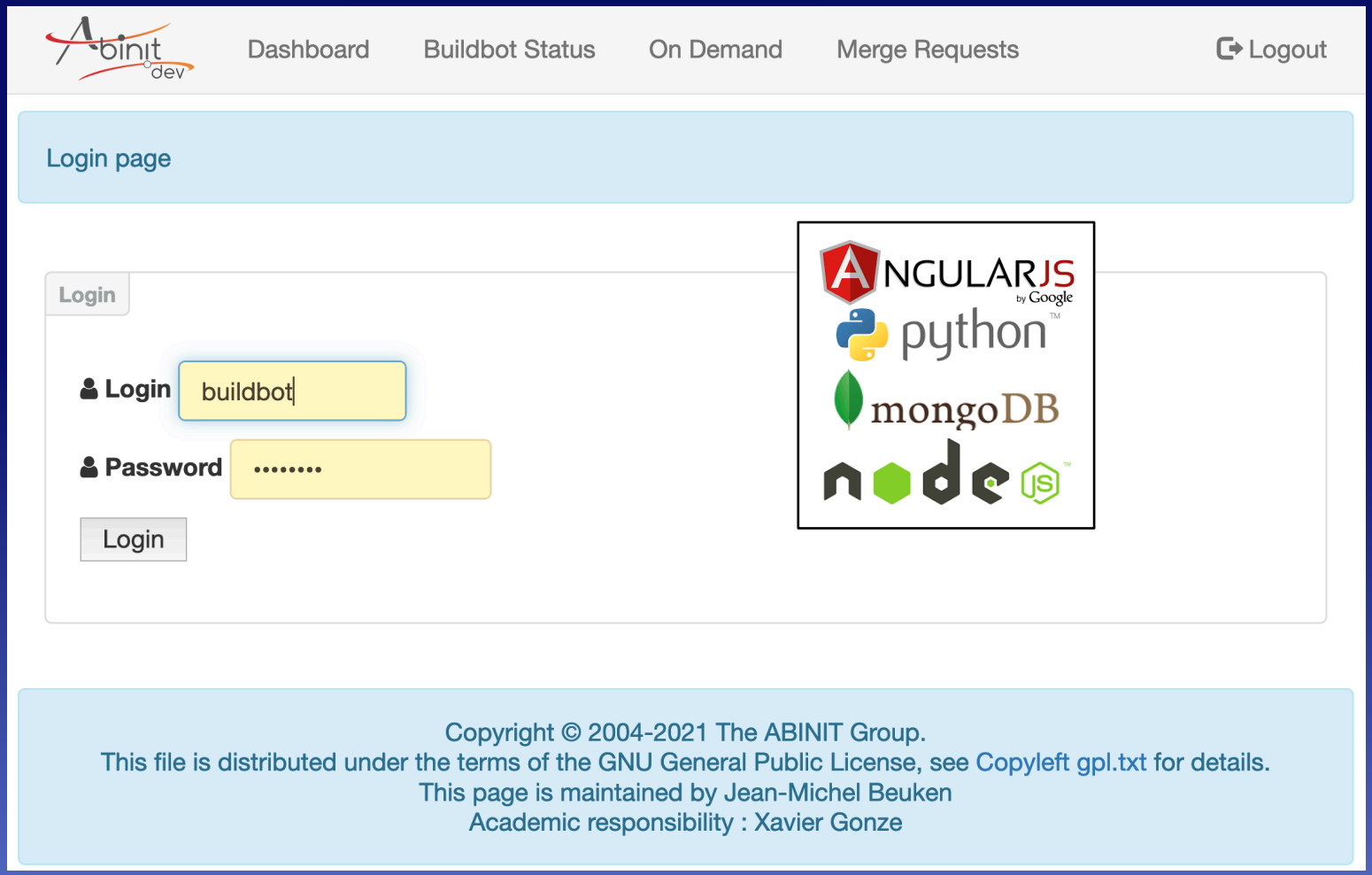
Buildbot Portal

BBportal

https://bbportal.abinit.org



Buildbot Status

BBportal

Dashboard | Buildbot Status | On Demand | Merge Requests | Logout

filters : all | all | all

Summary of active bran

Branch	rev	Date	ARD	AI9	LPR	LPS	LPE	NAG	al8	al9	BO	CD	UG9	UI6	UMP
mverstra/develop/9829f3c5 [OD]	9.5.2	17/05 23:13			⚓										
trunk/_wchen/d2d090ed [NI]	9.5.2	17/05 18:10	⚓	⚓	⚓	⚓		⚓	⚓	⚓	⚓	⚓	⚓	⚓	⚓
wchen/tal/31a1a413 [NI]	9.5.2	16/05 14:15	⚓	⚓	⚓	⚓		⚓	⚓	⚓	⚓	⚓	⚓	⚓	⚓
trunk/_mverstra/6a62b625 [NI]	9.5.2	14/05 21:50	⚓	⚓	⚓	⚓		⚓	⚓	⚓	⚓	⚓	⚓	⚓	⚓
fbottin/develop/4e355d50 [NI]	9.5.1	14/05 15:41	⚓	⚓	⚓	⚓		⚓	⚓	⚓	⚓	⚓	⚓	⚓	⚓
mverstra/develop/ea045319 [MR]	9.5.2	13/05 08:53	⚓		⚓	⚓									

Point on abbreviation to show the builder name

WAITING | RUNNING | SUCCEED | KILLED

Execution time of build+tests on nightly

Actual load of buildb

Host	abiref	alps	atlas	bob	buda2	pe	ubu
#threads	48	80	16	12	32	8	48
Load	0.00	0.00	0.03	0.00	0.00	3	0.00

Builder alps_gnu_9.3_openmpi Build #71

Results:

Build successful

SourceStamp:

Project	abinit
Repository	git@gitlab.abinit.org:mverstra/abinit.git
Branch	develop
Revision	9829f3c5238567337a6028ca2884db1ffc723c47
Got Revision	9829f3c5238567337a6028ca2884db1ffc723c47
Changes	1 change

BuildSlave:

alps

Reason:

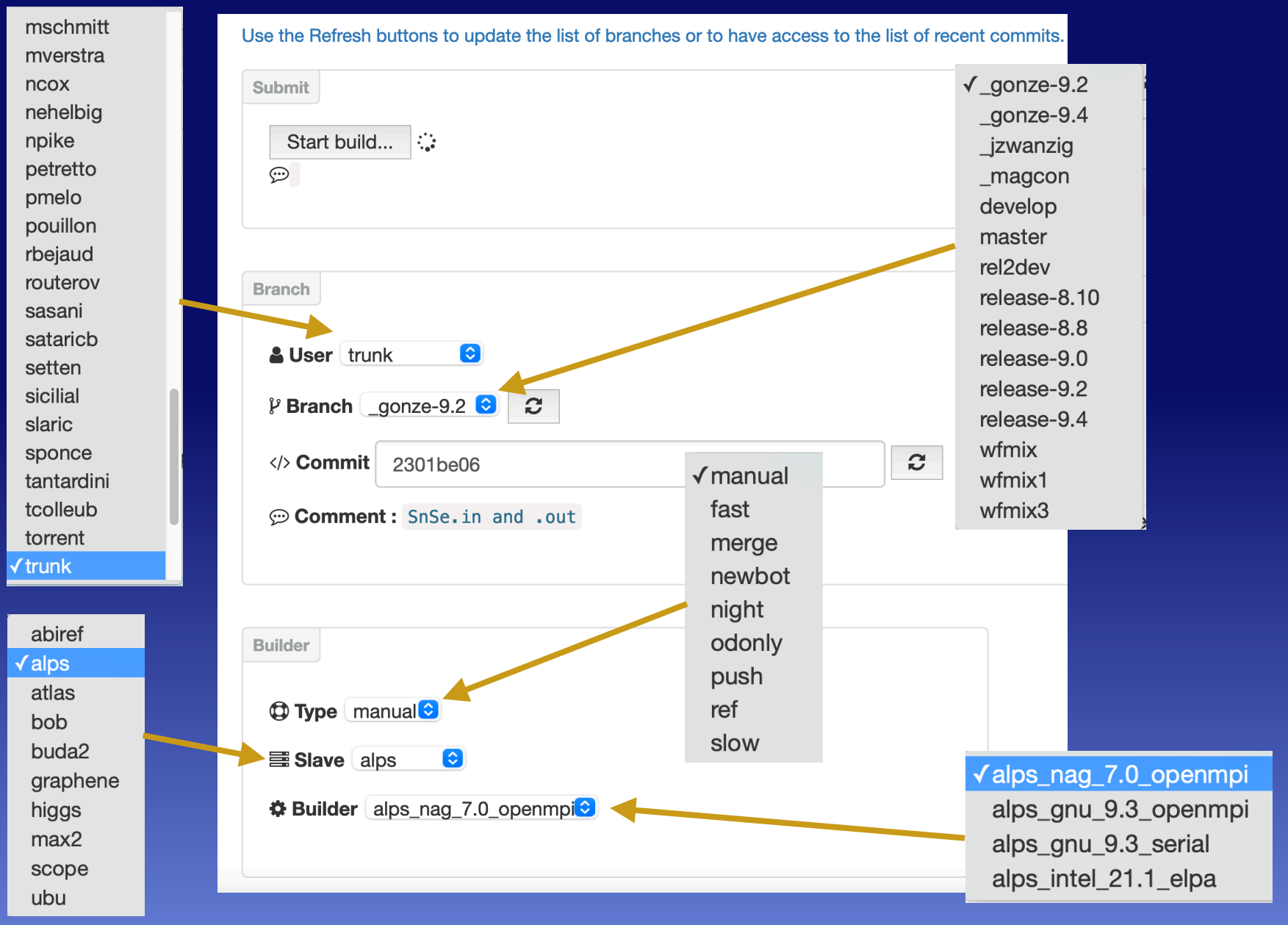
The SingleBranchScheduler scheduler named 'alps_gnu_9.3_openmpi' triggered this build

Steps and Logfiles:

1. pre-cleaner cleaning done (0 secs)
   1. stdio
2. PreBuild.py Pre_Build done (0 secs)
   1. stdio
3. checkout update (25 secs)
   1. stdio
4. makemake makemake (12 secs)
   1. stdio
   2. abisrc_err
   3. abisrc_out
   4. stderr
   5. stdout
5. buildbot.ac buildbot.ac (0 secs)
   1. stdio
   2. buildbot_ac
6. touch touch (0 secs)
   1. stdio
7. configure configure (13 secs)
   1. stdio
   2. config_optim
   3. config_log
   4. config_dump
   5. config_h
8. testbot.cfg testbot.cfg (0 secs)
   1. stdio
   2. testbot_cfg
9. make_core make core (8 mins, 37 secs)
   1. stdio
   2. make
   3. stderr
10. abienv abienv (0 secs)
    1. stdio
    2. abienv
11. testsuite runtests.py (47 mins, 15 secs)
    1. stdio
    2. xreport
    3. testbot
    4. summary
    5. All Results
12. upres uploading testbot_summary.json (0 secs)
    1. - no logs -
13. PostAnalysis.py Post-processing done (0 secs)
    1. stdio

On Demand Form

BBportal



Merge Requests

BBportal

Trunk › abinit › Merge requests › !790

Merged Created 1 week ago by Matthieu Verstraete Contributor Edit

bug fix in nspden 4 DFPT for Fe

Overview 0 Commits 8 Changes 8

Bin Xu found a bug in the treatment of DFPT with non collinear magnetization. If the spin was purely along y it crashed with NaN energies -> the normalization of the GS spin density matrix eigenvectors was done ignoring the complex nature of the arguments. Fixed

Also, appear to have fixed outstanding issues about band parallelization and wf1 residual calculation.

Some instability on graphene: no changes in relevant code, but paral/96 fails sometimes, even in sequential.

Request to merge `mverstra:develop` into `develop`

Approval is optional

Merged by Trunk 1 week ago Revert Cherry-pick

The changes were merged into `develop` with `ceaede2b`

Merge iid				
790	mve 1			te 12
789	gmatteo/ 0			05
788	blanc 0			16
787	jzwa 0			06
786	gmatt 2			12
785	gingras.ol/develop 23/04-05:05 7b1aac	trunk/develop	Correction of tutorials Rf1 and Rf2 for version 9	merged 24/04-05:57
784	mverstra/dfpt_band_paral_clean 19/04-10:52 ae953e	trunk/develop	parallel band memory distribution for DFPT.	merged 20/04-05:57

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Todo

Current status

DELL R430
Xeon E5-2603 @1.6Ghz
8Gb RAM

GitLab 13.12

Buildbot 0.8.12
(python 2.7)

BBportal
(AngularJS)

End-of-live

Tasks status

SuperMicro
Xeon E-2226G @3.40Ghz
32Gb RAM ✓

GitLab 13.12 ✓

migration
"easy"

Redesign of
the configuration
"difficult"

Buildbot 3.x
(python 3.7)
Buildbot UI

BBPortal?
Which tech? ?

https://bbportal.abinit.org