The test farm and its evolution

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Outline

- Quick reminder concerning buildbot infrastructure

- Current state of test farm (update since Fréjus 2017)

- Current state of BBportal

- Future developments

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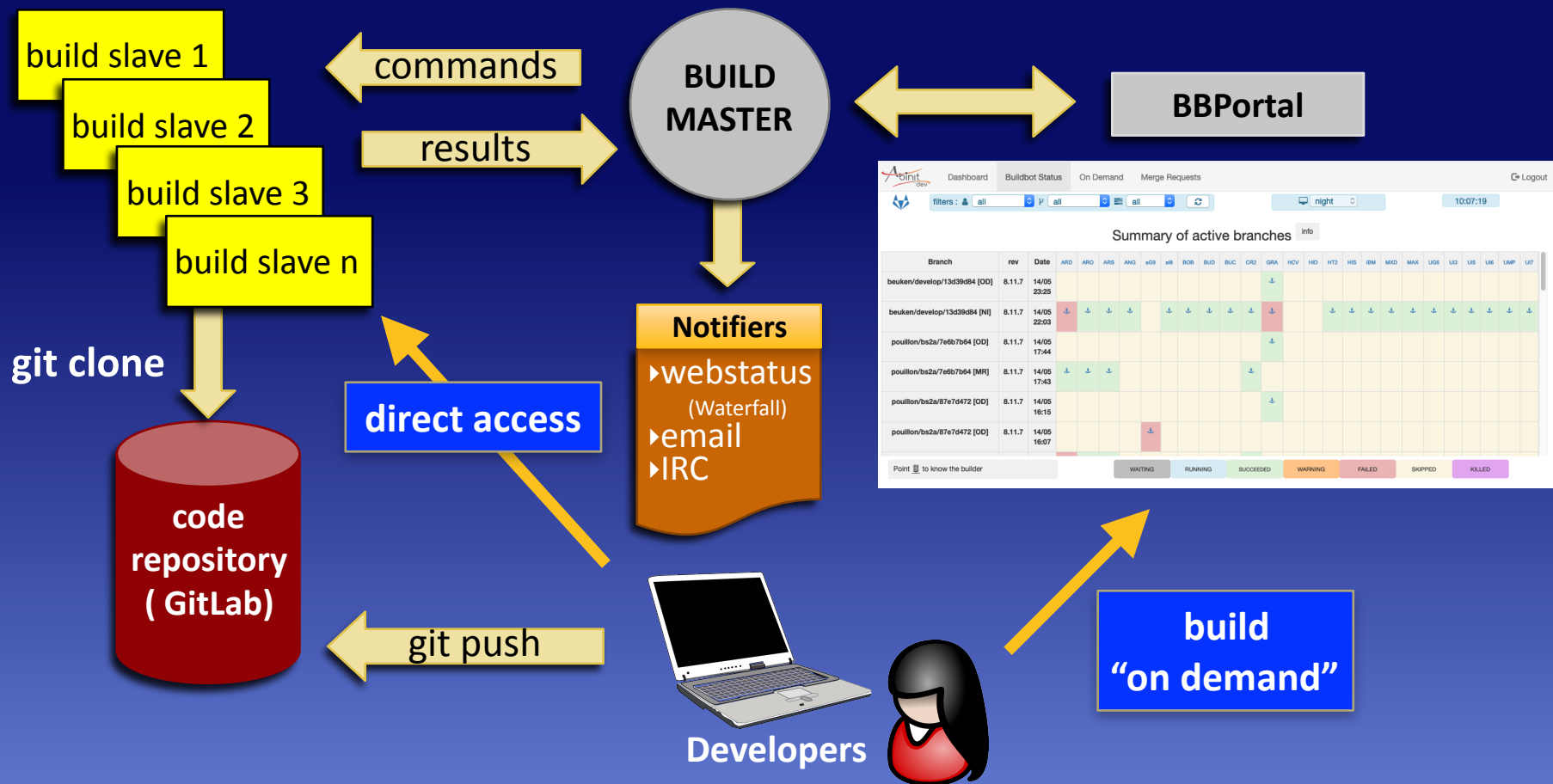
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BuildBot *(http://buildbot.net)* is a **powerful python framework** that can automate all aspects of the software development cycle (Continuous Integration, Continuous Deployment, Release Management, …)

It consists of a **buildmaster** and a set of computer (**buildslaves***)* connected in a star topology :

- The **buildmaster** is the central point of control : it makes all decisions about what, when, and how to build.
- The **builders** associated to **buildslaves**, are in charge of performing sequence of actions (**buildsteps**) related to building software (checking, configure, make, run tests, …), but it can also run arbitrary commands (shell command,…) .

Buildbot in Action

- During build cycle, status informations are saved and are used to update the status on the web page : "**waterfall**" (chronological logs of events) or on the **BBPortal**.
- The completion of a build will cause **email** to be sent to the developer.
- **buildbot** runs task on demand or when a merge requests are submitted to GitLab

build slave 1

build slave 2

build slave 3

build slave n

commands

results

BUILD MASTER

BBPortal

git clone

direct access

Notifiers
‣webstatus
  (Waterfall)
‣email
‣IRC

code repository (GitLab)

git push

Developers

build "on demand"

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in red : modified since Fréjus 2017

Name	Brand	CPU / Freq	# cores	RAM	OS	misc
abiref	HP DL360 gen9	Xeon E5-2670v3/ 2.3	2 x 24	32Gb	CentOS 7.6	Ref
atlas	**Supermicro**	**Xeon E5-2623v4/ 2.6**	**2 x 8**	**64Gb**	**CentOS 7.6**	
bob	Dell R430	Xeon E5-2603v3/ 1.60	2 x 6	8Gb	Fedora 23	
buda2	**SuperMicro**	**Xeon Silver 4110/ 2.7**	**2 x 16**	**16Gb**	**CentOS 7.6**	**2xGPU K40c 1xGPU TITAN V**
cronos2	**HP DL185 G7**	**AMD Opteron 6276/ 2.3**	**2 x 16**	**128Gb**	**CentOS 7.6**	**Ref**
cronos	**HP DL185 G7**	**AMD Opteron 6276/ 2.3**	**2 x 16**	**48Gb**	**CentOS 7.6**	**clusterMPI**
graphene	Apple MacPro	Xeon E5-2697/ 2.7	1 x 12	64Gb	MacOS X 10.14	
higgs	**HP DL 360 G8**	**Xeon E5-2440/ 2.4**	**2 x 6**	**32Gb**	**Ubuntu 18.04**	
ibm8	IBM Power S824	Power8/ 3.0	8	8GB	AIX 7.2	
max2	HP DL185 G7	AMD Opteron 6140/ 2.6	2 x 8	12GB	Slinux 6.10	
ubu	HP DL360 G9	Xeon E5-2670v3/ 2.3	2 x 24	32GB	Ubuntu 16.10	

Slaves removed (Desktop) : inca, coba2, buda, testf, tikal, petrus, shiva

Name	Compiler	MPI	MATH	misc
abiref_gnu_5.3_openmpi	GNU 5.3	Open MPI 1.10.2	OpenBLAS	Reference
abiref_gnu_5.3_serial	GNU 5.3		OpenBLAS	Reference
abiref_nag_6.2_openmpi	NAG 6.2	Open MPI 2.1.2	OpenBLAS	
atlas_intel_18.0_openmpi	**INTEL 18.0**		**MKL18/FFTW3**	
bob_gnu_5.3_openmp	GNU 5.3		ATLAS	OpenMP n=2
buda2_gnu_8.2_mpich3	**GNU 8.2**	**MPICH 3.2.1**	**MKL17/FFTW3**	
cronos2_gnu_7.4_paral	**GNU 7.4**	**Open MPI 3.1.3**	**MKL18/FFTW3**	**Ref for tparal**
graphene_gnu_8.3_macports	**GNU 8.3**	**Open MPI 3.0.1**	**OpenBLAS**	**MacPorts**
higgs_intel_19.0_serial	**INTEL 19.0**		**MKL19/FFTW3**	
higgs_gnu_7.3_triqs2	**GNU 7.3**	**MPICH 3.2.1**	**Netlib**	**triqs 2.x**
ibm8_ibm_15.1_serial	IBM 15.1		Netlib	XLF
max2_gnu_5.3_mpich	GNU 5.3	MPICH 3.2.1	ACML 6	memory leak
max2_gnu_5.3_dep	GNU 5.3	MPICH 3.2.1	ACML 6	dependency
ubu_gnu_5.3_openmpi	GNU 5.3	Open MPI 1.8.8	MKL11/FFTW3	NetCDF4/HDF5
ubu_intel_13.1_openmpi	**INTEL 13.1**	**Open MPI 1.6.5**	**MKL11/FFTW3**	
ubu_intel_15.0_mpich	INTEL 15.0	MPICH 3.2.1	MKL11//FFTW3	
ubu_intel_16.0_mpich	INTEL 16.0	MPICH 3.2.1	MKL11//FFTW3	
ubu_intel_16.0_openmp	INTEL 16.0		MKL11//FFTW3	OpenMP n=2 / dfti
ubu_intel_17.0_openmpi	INTEL 17.0	Open MPI 2.1	MKL11//FFTW3	NetCDF4/HDF5

Name	Compiler	MPI	MATH	misc	nightly
abiref_gnu_5.3_debug	GNU 5.3				yes

- ○ tests less used options (e.g. omp, exports, cclock)
- ○ tests robodoc
- ○ tests parents
- ○ checks the html links (in site/)
- ○ checks 15 abirules ("defined but not used", "Unused variable", "Unused dummy argument",…)
- ○ checks 10 buildsys ("check-build-examples", "check-cpp-options",…)
- ○ tests the "Build system" (e.g. make distcheck)

buda2_gnu_8.3_cuda	**GNU 8.3**	**Open MPI 3.1.4**	**MKL 2017**		**yes**

- ○ build with MAGMA 1.5 & MKL & CUDA 6.5
- ○ tested with NVIDIA GPU 2 x K40c (Kepler) + TITAN V (Volta)

higgs_gnu_7.3_cov	**GNU 7.3**	**MPICH 3.2.1**	**MKL11/FFTW3**		**no**

- ○ generation of a code coverage report (-fprofile-arcs -ftest-coverage)

atlas_gnu_9.1_openmpi	**GNU 9.1**	**Open MPI 4.0.1**	**OpenBLAS**		**no**

- GCC 4.X "deprecated"
- All Fallbacks are external

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Dashboard   Buildbot Status   On Demand   Merge Requests   Logout

filters :   all   develop   all   night   15:02:22

Summary of active branches   info

Branch	rev	Date	ARD	ARO	ARS	ANG	aG9	al8	BOB	BUD	BUC	CR2	GRA	HCV	HID	HT2
beuken/develop/13d39d84 [OD]	8.11.7	14/05 23:25											⚓			
beuken/develop/13d39d84 [NI]	8.11.7	14/05 22:03	⚓	⚓	⚓	⚓		⚓	⚓	⚓	⚓	⚓	⚓			⚓
beuken/develop/13d39d84 [OD]	8.11.7	14/05 11:24										⚓				
jzwanzig/develop/6149b25d [MR]	8.11.7	13/05 21:34	⚓	⚓	⚓							⚓				
jzwanzig/develop/6149b25d [NI]	8.11.7	13/05 19:54	⚓	⚓	⚓	⚓		⚓	⚓	⚓		⚓	⚓			⚓
jzwanzig/develop/5ed6f1e4 [NI]	8.11.7	13/05 13:16	⚓	⚓	⚓	⚓		⚓	⚓	⚓		⚓	⚓		⚓	⚓

Point 🖥 to know the builder

WAITING   RUNNING   SUCCEEDED   WARNING   FAILED   SKIPPED   KILLED

Execution time of build+tests on nightly builders   show   info

Actual load of buildbot slaves

Host	abiref	atlas	bob	buda2	cronos2	graphene	higgs	ibm8	max2	ubu
#cpu	48	16	12	32	32	24	24	16	16	48
Load	0.00	0.00	0.01	0.22	0.00	0.02	0.00	0.05	0.02	0.00

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List of future developments on software infrastructure :

◉ End of Life for Python 2.7 is coming in 2019

- Buildbot is dropping support for Python 2.7
  ToDo : upgrade buildbot v0.8.12 -> v2.3.0

- Python update on all slaves (OS, virtualenv, miniconda3, ...)

◉ End of Life for AngularJS v1.5

- BBPortal is built on AngularJS v1.5
  Can try to update to v1.7 (but Long Term Support through June 30, 2021)
  ToDo : evaluate several frameworks : Angular.js vs React.js vs Vue.js

List of future improvements of the test farm:

◉ Add a builder "HPC"

  • Running tests on CECI clusters requires the use of the batch : asynchronous
    ToDo : finish up the hpc tests

◉ Need tests to check scalapack code

◉ Keep watch automatically on :

  • excluded tests

  • code coverage results

  • evolution of test execution times
    ToDo : put status on Dashboard ?

Future evolution of the hardware infrastructure :

◉ **ThunderX2® Arm-based Processor** with promising technology for HPC

- ARM team with the help of the CEA has already compiled ABINIT 8.10.1 (ARM compiler)

- ThunderX2®CN99XX is expensive

ToDo : evaluate the processor on the cloud if it exists