SAT Heritage

a community-driven effort for archiving, building and running more than thousand SAT solvers

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Why SAT Heritage?

SAT has a long history of good practices

- source codes are widely distributed
- competitions are archiving and distributing sources

But better practices are possible :

- reproducibility / reproduction
- compilation may not be easy (dependencies, languages, ...)
- long-term archiving of solvers is not easy
- each solver has its own set of parameters (may be not explicit in some papers)

Many solvers, many (conflicting) dependencies

Date	#Solvers	Collection	Type	Date	#Solvers	Collection	Type
$\leq$2000	24	Satex	s / b	2011	104	Contest (2)	s / b
2002	27	Contest (1)	b	2012	65	Challenge	-
2003	33	Contest (1)	b	2013	140	Contest (3)	s(*) / b(*)
2004	63	Contest (1)	b	2014	150	Contest (3)	s(*) / b(*)
2005	47	Contest (1)	b	2015	31	Race (2)	-
2006	16	Race (1)	-	2016	32	Contest (4)	s / b
2007	31	Contest (2)	s / b	2017	71	Contest (4)	s / b
2008	19	Race (1)	-	2018	66	Contest (4)	s / b
2009	64	Contest (2)	s / b	2019	55	Race (3)	s / b
2010	20	Race (1)	-	**Total**	**1058**		

Why a tool (and not just a few repositories?)

The tool must be easy to run (all included)

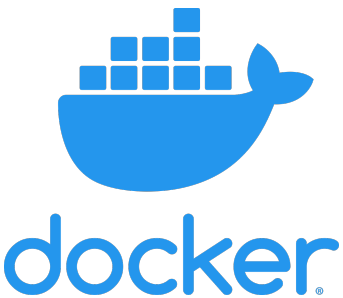
One line to run them all

The tool must provide the basis for a community effort

SAT Heritage : built on tools designed to last

Archiving and versioning of SAT Heritage

Archiving (large files) / DOI for referencing



Container solutions for Linux images

Guix Detailed Linux Images (reproducibility)

Why using Docker? 1/2

Docker is a recent set of tools (2013) aiming and ”simulating” virtual OS inside a Docker Engine.

On Linux, Docker is like a `chroot` command (with tons of other functions)

Filesystems are handled incrementally :

- Two docker images of two SAT solvers built on the same base share all the libraries, except the SAT solver binaries
- It is space efficient

Why using Docker? 2/2

In our tool, a docker image is built temporarily to compile the solver.

Then, only the necessary binaries are kept inside the container to optimize the space.

about efficiency :

- Docker images are widely used on clusters to allow users to use their own libraries/tools
- There is almost no lost in performances on Linux machines
- On MacOS, the docker engine has to be run inside a virtual machine

How to use it?

How to use it?

See Demonstration by G. Audemard

How to contribute ?

How to contribute?

See Demonstration by L. Paulevé

Future work and conclusion

What's next?

- an easy integration with SAT competitions
- better integration of proofs (proof checkers included in containers)
- special branches for prolific authors
- digital signatures for "certified by authors" solvers with command lines
- build another tool for benchmarks generation
- maintain it

SAT Heritage is in your hands