A perl script for automated API bundle installations (SAGA)

SAGA-Group

06-13-2011

Abstract

Developing, testing and debugging of software packages before making them available for the production environment should be well tested on various testing platforms. Packages to be released in future, in this case an update made for the previous version, again are made bug-free and versatile to the changing environments and dependent packages. Above noted steps involved in software deployment of any software package can often be complex and is made short through automated build systems, and continuous integration frameworks. The best case however is to have a software deployment tool that automates every single step of deployment - developing, bug tracking and distribution. Present paper deals with a simple perl script (mephisto.pl) that automates build process of SAGA (Simple API for Grid Applications), a tool that can be generalized for any developing software package. The paper would also go through the working model of mephisto and discuss its future work of featuring as a continuous integration tool and later serve as a software deployment tool for SAGA. The paper will also try to explore some of the existing software deployment tools such as NMI-GRIDS testing, NMI build and test lab, and automated building tools such as Buildbot to try to explain its standing with respect to the script being developed.

1. Introduction

Developing software packages require immediate bug fixes and tools for faster deployment. Like many other software packages, SAGA was required to be installed on different platforms to carry out version compatibility tests of its dependency packages, bug fixes and running applications . In the beginning manual installations were employed to get a working copy of SAGA on different machines. This was time consuming since installations required its dependencies to be taken care of, which differed with every working platform. Also any version update made to SAGA or its dependencies should be tested on different platforms but installations of the newer versions were necessary prior testing. Tracking and reporting bugs from testing for software betterment was important before deploying bug free SAGA version on production environment or for applications to be carried out. This cyclic process required repeated installations and manually installing them every time would slower the development cycle. Also extra care was to be taken to make sure the development community were on the same page with respect to different bugs suspected, their logs, changes already made and tested. This required a central administrator for co-ordinating all the work, which lacked a distributed framework essential for a smooth and exponential development process. Hence the problem was to develop a tool that automated installations, bug tracking and maintain a log record for the developers which would in turn facilitate parallel independent research work into developing SAGA. This is practiced in many software development process for faster development and to stay stable with their dependency packages updates on all platform alike. Thus 'mephisto.pl', a perl script was developed to fill in for automated installations. A simple command line option would install SAGA and all its dependencies irrespective of the underlying computer resource used. This was later hoped to be integrated with Buildbot, an automated software testing tool, which would then automate both development and testing. The paper will proceed to explain more about mephisto and its working in Section 3 following some of the existing deployment tools and possible discussed in Section 2.

2. Existing methods

Software deployment process involves developing and building, packaging, tagging a release, and automatically deploying them on the required systems. There are wide variety of deployment tools available in the market or open source tools for general software packages. Deployment tools available for grid computing software packages are constrained to a few. CMS and ADEM are few aimed at deploying grid computing software packages at CERN. NMI scripts, buildbot are few others aimed at automating building process. Three types of build systems : 1,2,3. many tools aimed at such build system are NMI scripts and buildbot to name a few. 3.1.1 NMI scripts: 3.1.2 Buildbot: buildbot, NMI scripts like -¿ mephisto

3. Working of mephisto

Example of the command line statement:

```
 perl mephisto install
--target-dir=/home/user/saga
 --tmp-dir=/home/user/tmp-saga
```

3.1 Thought behind mephisto

3.2 Commands for execution

GIven are all the various options available for users disclosure. By default if no option is specified, mephisto pulls up the packages listed on repository at

`http://static.saga.cct.lsu.edu/mephisto/repository/latest/INDEX.`

Expanded version of the Command to run mephisto

```
perl mephisto install/test
--target-dir=/path/to/folder
--tmp-dir=/path/to/folder
--with-saga-version=
--with-boost-version=
--with-globus-version=
--repository= --with-adaptors=
--with-python-version=
--with-postgresql-version=
```

install
This can be used to install a working copy of SAGA and all its dependencies specified.
test
This option not only installs SAGA but also runs the command 'make check' to check the installation. It creates a log file displaying the test results.
target-dir
This option is used to specify the path you need to install SAGA and all packages libraries. By default, it creates a folder at tmp/meph_inst.
tmp-dir
This option is used to specify the path for a temporary folder to download all the packages and create log files. If not mentioned, it creates a folder at /tmp/meph_tmp
repository
Can be used to choose different repositories to install SAGA from. Two repositories available as of now are 'latest' (default) and svn_trunk. Recommended svn_trunk for the most recent SAGA version.
with-saga-version
Choose saga versions available.
with-boost-version
Choose boost versions available >=1.40.0
with-globus-version
Choose globus version available >=4.0. This option would automatically invoke installations of X509, globus adaptors too.
with-adaptors
Mention any adaptors to install that would invoke globus installations along with saga-adaptors too.
with-python-version
Choose from the list of python versions available. Must be >=2.6.2
with-postgresql-version
Choose from postgresql versions available. Should be >=8.4.1

2.3 Repositories for Mephisto

Mephisto uses two different repositories for SAGA packages which have been pre-defined by the SAGA group, namely:

`(i) http://static.saga.cct.lsu.edu/mephisto/repository/latest/`

`(ii) http://static.saga.cct.lsu.edu/mephisto/repository/svn_trunk`

When the user doesn't define any repository, the default repository taken by mephisto will be *http://static.saga.cct.lsu.edu/ mephisto/repository/latest/*.

3.3 Future of mephisto

3.4 Availability

A copy of mephisto.pl can be obtained from *http://faust.cct.lsu.edu/trac/mephisto*. Other details and documentation can be found on the same website. An installed version of perl would be necessary on your system to run mephisto.pl

4. Conclusion