Mephisto Documentation

SAGA-Group

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Introduction

Mephisto is a perl script that supports SAGA (Simplified API for Grid Applications) installations. SAGA is an API that provides the basic functionality required to build distributed applications, tools and frameworks so as to be independent of the details of the underlying infrastructure [1] [2]. More information on SAGA can be found on the website:

```
http://www.saga.cct.lsu.edu/
```

SAGA installations require to install various dependency packages. Mephisto is a tool that automates the installation process of SAGA, installing all its dependencies specified for SAGA and SAGA adaptors too. The version number of all the packages and the type of packages can be specified by the user at the command line. The description of all the command line options available are described in the next section.
Example of the command line statement:

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

This will be followed by few random examples of mephisto usage and screenshots taken during the process. Refer to the last section for common errors found and suggestions to counter them

Command line options

This section discusses all the various options available at users disclosure. By default if no option is specified, mephisto pulls up the packages listed on the repositories listed 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

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/*.
The list of packages pre-defined for (i) are:
SAGA= 1.5.2;
Boost= 1.40.0;
Python=2.6.2;
Post-gre-sql=8.4 .1 ;
Sqlite=3.6.18;
SAGA-PYTHON;
SAGA-ADAPTORS-X509;
SAGA-ADAPTORS-SSH.

The list of packages pre-defined for (ii) are:
SAGA= 1.5.4 (updated as of now);
Boost= 1.40.0;
Python=2.6.2;
Post-gre-sql=8.4 .1 ;
Sqlite=3.6.18;
SAGA-PYTHON.

The suggested repository to be utilized by the user will be *svn_trunk* that is updated with the latest version of SAGA as and when new version is released with bug fixes. Example to switch between repositories follows in the next section.

Example Command line options

NOTE: All examples here are tackled one at a time. They can be used interchangeably. Choice has to be made between 'install' and 'test'

- Basic Default command

```
perl mephisto install
```

This would install SAGA. All the default options will be loaded as no option was chosen here. As of now the default options are as foretold from the repository given below. As no directory was mentioned all the packages will be stored in a temporary folder created by the script.

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

- Command with paths to folders

```
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder
```

This will install all packages in the folder specified.

- Install SAGA from svn_trunk repository

```
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --repository=svn_trunk
```

Choose snv_trunk repository to install SAGA. This will have the most recent and tested working SAGA version.

- Install SAGA will all saga, globus, boost versions specified

```
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-saga-version=1.5.3
--with-boost-version=1.44.0 --with-globus-version=5.0.2
(or)
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-saga=1.5.3
--with-boost=1.44 --with-globus=5.0.2
```

To install SAGA with different boost, SAGA and globus versions. Given here are two ways of defining the versions. Using all the three is not compulsory and any combination can be used. Any version not mentioned will infer default options.

- Globus installations

```
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-globus-version=5.0.2
```

Specifying any globus installations will also invoke globus adaptors installations which are required and necessary with globus.

- Install SAGA with Globus adaptors

```
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-adaptors=globus
```

To install globus adaptors. Automatically invokes globus installations which is required for adaptors. Also automates x509 adaptors installations too. This is similar to what we have in the previous example but different command line options have been given for easy usage.

- How to install a SAGA Core Pre-Release with a specific Boost version (for developers)

```
perl mephisto install --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-saga=1.5.3-pre
```

For developers, this would install the pre-release version from the given link shared in the email with boost and all other dependencies creating log files necessary for debugging.
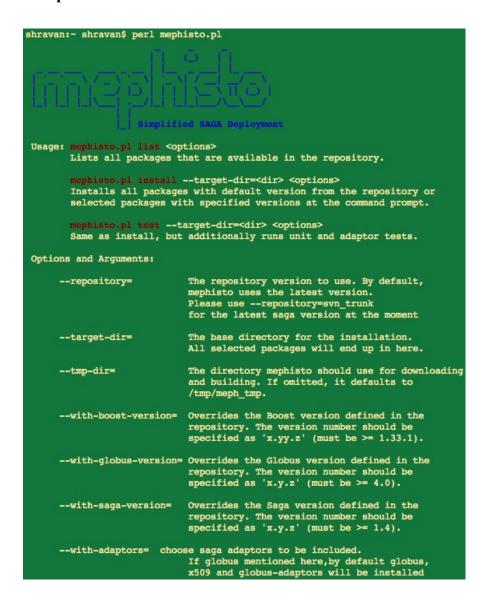
- Install with Python versions

```
perl mephisto test --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-python-version=2.7.1
```

Install with any python version >=2.6.2. Please note that you may be thrown an error and break from the build for versions incompatibility.

- Install with postgresql version

```
perl mephisto test --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-postgresql-version=8.4.2
```

Similar to what was described earlier for python versions right above.

- Install and proceed to TEST the installations

```
perl mephisto test --target-dir=/path/to/any/desired-directory/
--tmp-dir=/path/to/temp/folder --with-saga-version=1.5.3
--with-boost-version=1.44.0 --with-globus-version=5.0.2
```

Choose 'test' option to first install SAGA and its dependencies and then have it continuously perform 'make check' operation and create a log file in the end.

Example of Screen Shots after execution of different commands

- User command options screen

```
shravan:~ shravan$ perl mephisto.pl

                  _   o   _
             __  | |     | |
            |  | | |     | |___
     mephisto
                      |_| Simplified SAGA Deployment

Usage: mephisto.pl list <options>
       Lists all packages that are available in the repository.

       mephisto.pl install --target-dir=<dir> <options>
       Installs all packages with default version from the repository or
       selected packages with specified versions at the command prompt.

       mephisto.pl test --target-dir=<dir> <options>
       Same as install, but additionally runs unit and adaptor tests.

Options and Arguments:

     --repository=          The repository version to use. By default,
                            mephisto uses the latest version.
                            Please use --repository=svn_trunk
                            for the latest saga version at the moment

     --target-dir=          The base directory for the installation.
                            All selected packages will end up in here.

     --tmp-dir=             The directory mephisto should use for downloading
                            and building. If omitted, it defaults to
                            /tmp/meph_tmp.

     --with-boost-version=  Overrides the Boost version defined in the
                            repository. The version number should be
                            specified as 'x.yy.z' (must be >= 1.33.1).

     --with-globus-version= Overrides the Globus version defined in the
                            repository. The version number should be
                            specified as 'x.y.z' (must be >= 4.0).

     --with-saga-version=   Overrides the Saga version defined in the
                            repository. The version number should be
                            specified as 'x.y.z' (must be >= 1.4).

     --with-adaptors=   choose saga adaptors to be included.
                            If globus mentioned here,by default globus,
                            x509 and globus-adaptors will be installed
```

- 'svn_trunk' repository used

- 'latest' repository used (default)

- Successful installations done

```
skilar1@cyder:~$ perl mephisto.pl install --target-dir=/home/skilar1/killer_saga_tmp --tmp-dir=/home/skilar1/killer_meph_tmp --with-saga=1.5.2 --with-boost=1.45 --repository=svn_trunk

                  mephisto
            Simplified SAGA Deployment

Source repository: http://static.saga.cct.lsu.edu/mephisto/repository/svn_trunk

o PYTHON: Python-2.6.2.tar.gz
o BOOST: http://sourceforge.net/projects/boost/files/boost/1.45.0.tar.gz/download
o POSTGRESQL: postgresql-8.4.1.tar.gz
o SQLITE: sqlite-amalgamation-3.6.18.tar.gz
o SAGA: SAGA-1.5.2
o SAGA-PYTHON: https://svn.cct.lsu.edu/repos/saga/bindings/python/trunk

Processing package PYTHON

Package path is http://static.saga.cct.lsu.edu/mephisto/repository/svn_trunk/Python-2.6.2.tar.gz

  o Downloading to /home/skilar1/killer_meph_tmp/1306355886//Python-2.6.2.tar.gz [OK]
  o Extracting package
    logfile: /home/skilar1/killer_meph_tmp/1306355886//PYTHON.unpack.log [OK]
  o Configuring package [./configure --enable-shared --prefix=/home/skilar1/killer_saga_tmp]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//PYTHON.configure.log [OK]
  o Building package [make]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//PYTHON.build.log [OK]
  o Installing packge to /home/skilar1/killer_saga_tmp
    logfile: /home/skilar1/killer_meph_tmp/1306355886//PYTHON.install.log [OK]

Processing package BOOST

Package path is http://sourceforge.net/projects/boost/files/boost/1.45.0/boost_1_45_0.tar.gz/download

  o Downloading to /home/skilar1/killer_meph_tmp/1306355886//BOOST [OK]
  o Extracting package
    logfile: /home/skilar1/killer_meph_tmp/1306355886//BOOST.unpack.log [OK]
  o Configuring package [./bootstrap.sh --without-libraries=mpi,graph,math --with-python-version=2.6 --prefix=/home/skilar1/killer_saga_tmp --with-python-root=/home/skilar1/killer_saga_tmp --libdir=/home/skilar1/killer_saga_tmp/lib]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//BOOST.configure.log [OK]
  o Building package [./bjam -sNO_COMPRESSION=1]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//BOOST.build.log [OK]
  o Installing packge to /home/skilar1/killer_saga_tmp
    logfile: /home/skilar1/killer_meph_tmp/1306355886//BOOST.install.log [OK]

Processing package POSTGRESQL

Package path is http://static.saga.cct.lsu.edu/mephisto/repository/svn_trunk/postgresql-8.4.1.tar.gz

  o Downloading to /home/skilar1/killer_meph_tmp/1306355886//postgresql-8.4.1.tar.gz [OK]
  o Extracting package
    logfile: /home/skilar1/killer_meph_tmp/1306355886//POSTGRESQL.unpack.log [OK]
  o Configuring package [./configure --without-zlib --prefix=/home/skilar1/killer_saga_tmp]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//POSTGRESQL.configure.log [OK]
  o Building package [make]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//POSTGRESQL.build.log [OK]
  o Installing packge to /home/skilar1/killer_saga_tmp
    logfile: /home/skilar1/killer_meph_tmp/1306355886//POSTGRESQL.install.log [OK]

Processing package SQLITE

Package path is http://static.saga.cct.lsu.edu/mephisto/repository/svn_trunk/sqlite-amalgamation-3.6.18.tar.gz

  o Downloading to /home/skilar1/killer_meph_tmp/1306355886//sqlite-amalgamation-3.6.18.tar.gz [OK]
  o Extracting package
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SQLITE.unpack.log [OK]
  o Configuring package [./configure --disable-tcl --prefix=/home/skilar1/killer_saga_tmp]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SQLITE.configure.log [OK]
  o Building package [make]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SQLITE.build.log [OK]
  o Installing packge to /home/skilar1/killer_saga_tmp
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SQLITE.install.log [OK]

Processing package SAGA

Package path is https://svn.cct.lsu.edu/repos/saga/core/tags/releases/saga-core-1.5.2/

  o SVN checkout to /home/skilar1/killer_meph_tmp/1306355886//SVN_SAGA [OK]
  o Configuring package [./configure --prefix=/home/skilar1/killer_saga_tmp --with-boost=/home/skilar1/killer_saga_tmp --with-postgresql=/home/skilar1/killer_saga_tmp --with-sqlite3=/home/skilar1/killer_saga_tmp]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SAGA.configure.log [OK]
  o Building package [make]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SAGA.build.log [OK]
  o Installing packge to /home/skilar1/killer_saga_tmp
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SAGA.install.log [OK]

Processing package SAGA-PYTHON

Package path is https://svn.cct.lsu.edu/repos/saga/bindings/python/trunk

  o SVN checkout to /home/skilar1/killer_meph_tmp/1306355886//SVN_SAGA-PYTHON [OK]
  o Configuring package [./configure --prefix=/home/skilar1/killer_saga_tmp --with-python=/home/skilar1/killer_saga_tmp --with-boost=/home/skilar1/killer_saga_tmp]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SAGA-PYTHON.configure.log [OK]
  o Building package [make]
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SAGA-PYTHON.build.log [OK]
  o Installing packge to /home/skilar1/killer_saga_tmp
    logfile: /home/skilar1/killer_meph_tmp/1306355886//SAGA-PYTHON.install.log [OK]

Environment setup file written to /home/skilar1/killer_saga_tmp/share/saga/saga-env.sh.        ===========>  Installations succeded


        Done installations or testing (check logs for outputs and other information) :)
```
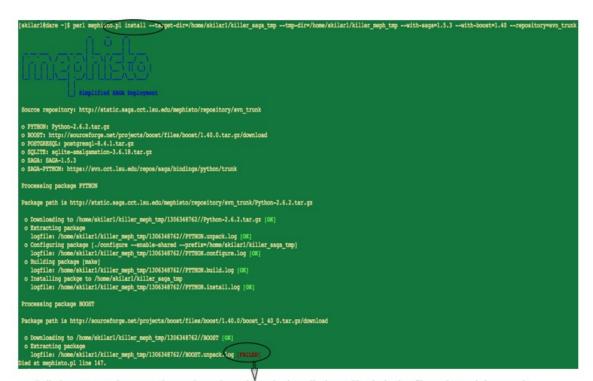
- Successful Testing done

Testing SAGA successful

- Failed Installations

Failed status can be spotted anywhere throughout the installations. Check the log file at the path here and write back to the SAGA group. May have compatibility issues. In this case, installation was interrupted.

- Failed tests

Test Failed (sample) after successful installations, check log files and report but SAGA might still work

Possible errors and debugging

Mephisto throws in an error saying "Failure" at any step it failed to execute. It dies with no further operation. The installation is halted with packages stored in the directory mentioned at the command line or default directory (if not mentioned). Note that the installation doesn't start where it halted. Log files are available and the path to the file is displayed on the screen for access and assessment. Possible errors and actions:

1) Version incompatibility: Any version incompatibility issues seen in the log files should be reported to saga-users@cct.lsu.edu and/or saga-devel@cct.lsu.edu mailing lists with the log files attached. Proper package compatible versions will be suggested or necessary changes will be made to SAGA package.

2) Failure to download package: This can be a serious bug in the mephisto code which means that the link is broken and necessary changes have to be made in order to have the version taken. Reporting to the above mailing lists will do the trick. Sometimes there are server problems from the website its downloading. Have few trials done with some time lapse between each run before confirming the error.

3) Wrong Directory Sorted(as seen in the log file) : This will mean a bug in the perl script and should be reported in the similar manner. People working on mephisto will get it fixed. Shouldn't be a problem and was not found till date!

References

[1] [Online]. Available: http://saga.cct.lsu.edu/

[2] [Online]. Available: http://saga.cct.lsu.edu/projects/tools-and-infrastructure