



CENTER FOR COMPUTATION
& TECHNOLOGY

SAGA

A Simple API for Grid Applications

SAGA Components: Installation and Deployment



omii-uk
www.omii.ac.uk

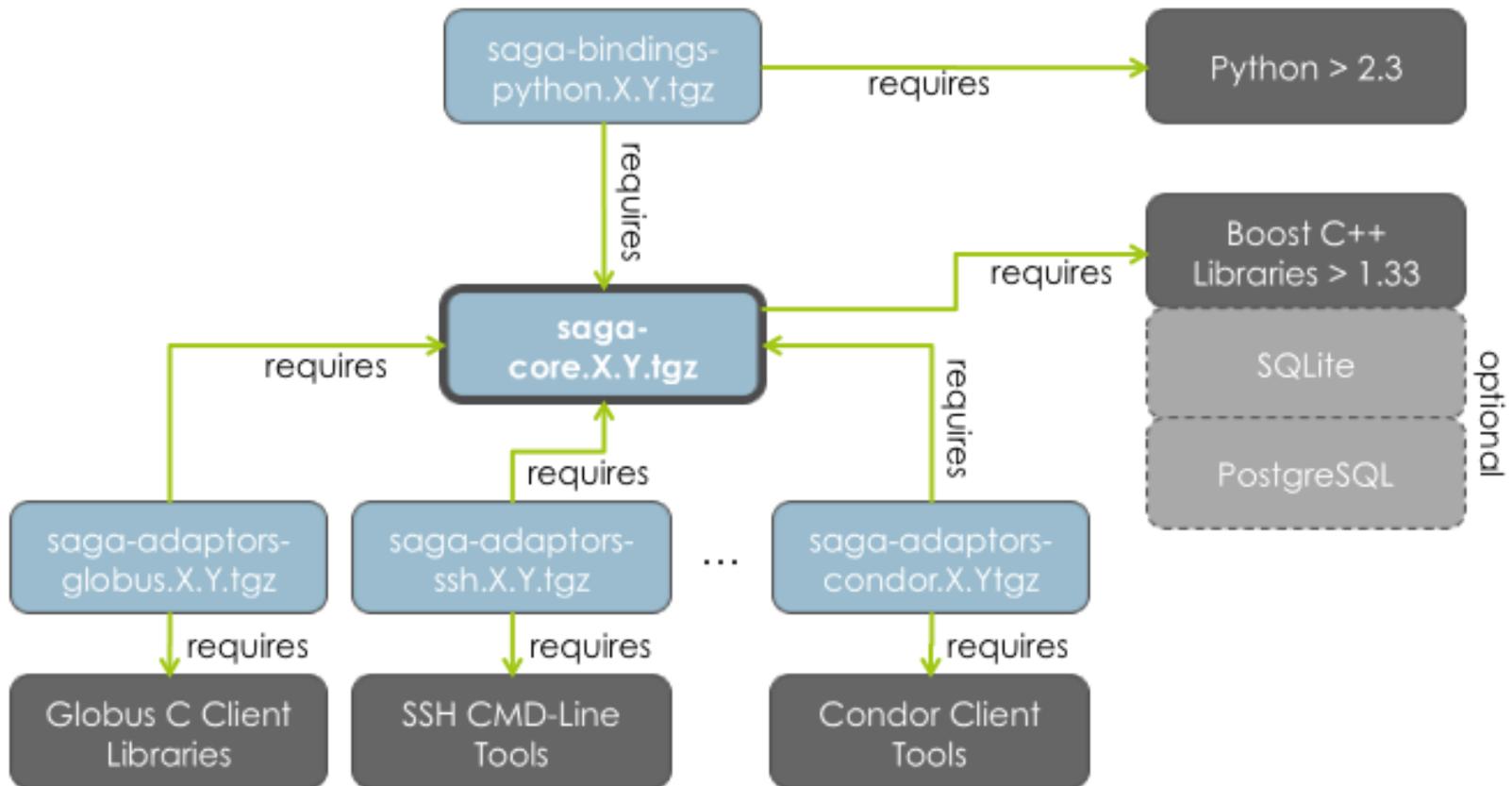


Outline

- ▣ SAGA's components
 - ▣ Overview, structure, dependencies
 - ▣ Available middleware bindings
- ▣ The SAGA build system
- ▣ Mephisto: A SAGA bootstrapping tool
- ▣ Ongoing cyber-infrastructure deployment
 - ▣ LONI (Louisiana Optical Network Initiative)
 - ▣ TeraGrid, FutureGrid
 - ▣ ...
- ▣ Outlook / Ongoing efforts

Overview | Structure | Dependencies

<http://saga.cct.lsu.edu/software/cpp/download>



Available Middleware Bindings (*Adaptors*)

- ▣ saga-adaptors-**default** (fork, local fs, SQL advert & replica)
- ▣ saga-adaptors-**ssh** (ssh job 'submission and fs ops via FUSE)
- ▣ saga-adaptors-**x509** (x509 security context)
- ▣ saga-adaptors-**globus** (GRAM2/5, GridFTP, RLS)
- ▣ saga-adaptors-**lsf** (Platform LSF jobs)

Available (Beta) Adaptors (cont.)

- ▣ saga-adaptors-**aws** (Amazon EC2, *about to be released*)
- ▣ saga-adaptors-**hdfs** (Hadoop file op., *about to be rel.*)
- ▣ saga-adaptors-**glite** (gLite-CREAM jobs, *experimental*)
- ▣ saga-adaptors-**pbspro** (PBS Pro jobs, *under review*)
- ▣ saga-adaptors-**torque** (Torque jobs, *under review*)
- ▣ saga-adaptors-**ogf** (hpc-bp support, *experimental*)
- ▣ ... and: **htable**, **kfs**, **naregi**, **ninfG**, **opencloud**

SAGA's Build System

- ▣ Sophisticated configure/make-based build system
- ▣ External dependencies are checked by configure/m4
- ▣ Internal dependencies between components are checked via the environment variable **SAGA_LOCATION**

```
$> export SAGA_LOCATION=/install/location/  
$> cd saga-bindings-python-0.9.3  
$> ./configure
```

```
=====  
SAGA Python BINDINGS - Configuration Summary  
=====
```

```
Using SAGA from      : /opt/saga-1.5.3-pre/ (install)
```

```
Python Found      : yes  
Python Version    : 2.6.1  
...
```

SAGA's Build System (cont.)

- ▣ `./configure` will tell you if a requirement is not met:

```
$> ./configure
...
checking for Boost headers version >= 1.33... no
configure: error: Could not find Boost headers version >= 1.33
```

- ▣ And if `SAGA_LOCATION` is not set, you will definitely end up with an error:

```
$> unset SAGA_LOCATION=/install/location/
$> cd saga-bindings-python-0.9.3
$> ./configure

checking SAGA sources... not found
checking SAGA installation... not found
checking for saga-config... no
checking saga-config prefix... invalid
configure: error: Could find neither SAGA source tree nor installation.
```

SAGA's Build System (cont.)

- ▣ **SAGA_LOCATION** must point to your saga installation directory
- ▣ Different Adaptors may have different configure options. **./configure --help** is your friend
- ▣ Each component comes with a file called:

INSTALL

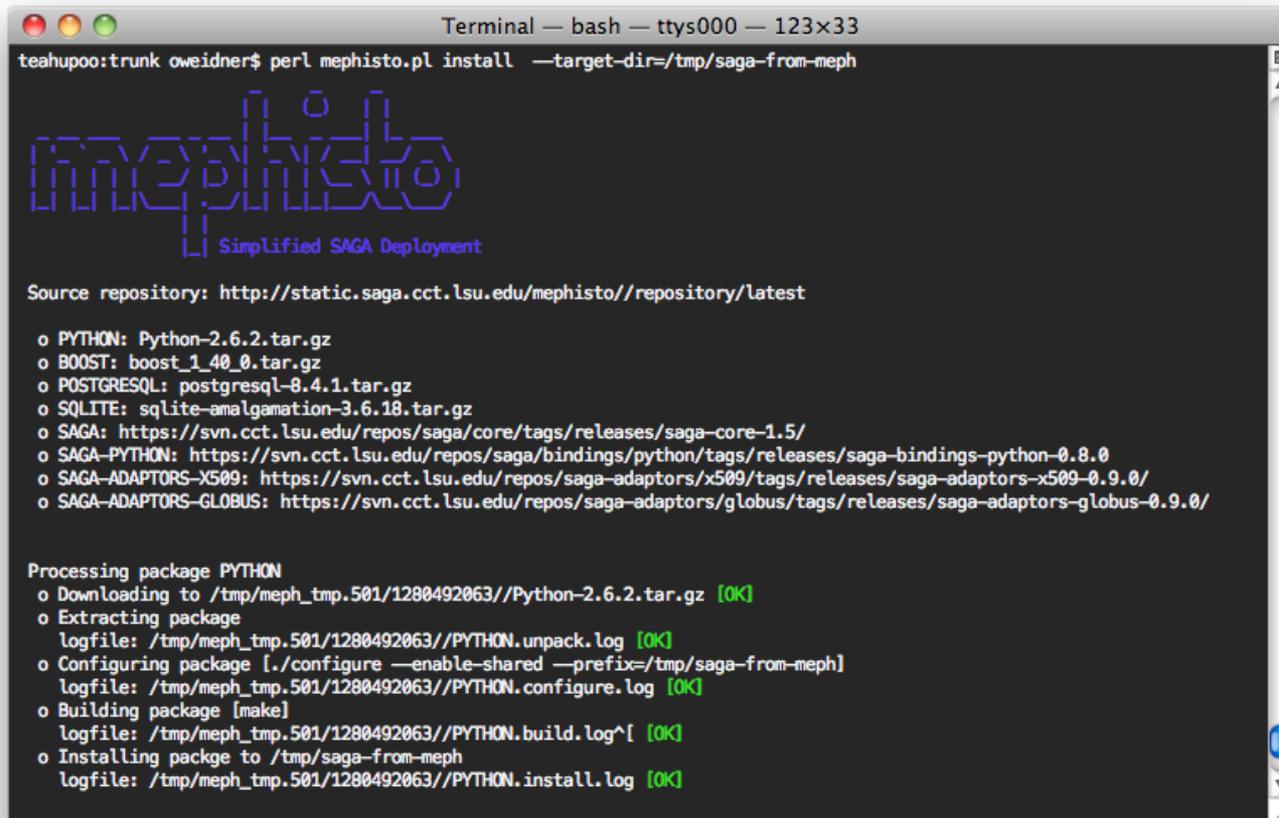
Read it!

Mephisto: SAGA Bootstrapping

- ▣ SAGA's build system is standard for a *NIX library... **BUT:**
- ▣ Installing SAGA on a machine that doesn't meet any of the prerequisites can be a tedious and lengthy process:
 - ▣ E.g. downloading and installing the Boost C++ Libraries, PostgreSQL, Python, FUSE, Globus Toolkit client libs, saga-core, saga-bindings-python, saga-adaptors-x509, saga-adaptors-globus, saga-adaptors-ssh ... will take **forever**.
 - ▣ Knowledge of certain configuration options that are relevant to saga (e.g. Python's --enable-shared option)
 - ▣ Requires constant attention and interaction
- ▣ Luckily, *There's an App for That!*™

Mephisto: SAGA Bootstrapping (cont.)

<http://faust.cct.lsu.edu/trac/mephisto>



```
Terminal — bash — ttys000 — 123x33
teahupoo:trunk oweidner$ perl mephisto.pl install --target-dir=/tmp/saga-from-meph

  mephisto
  |
  | Simplified SAGA Deployment

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

o PYTHON: Python-2.6.2.tar.gz
o BOOST: boost_1_40_0.tar.gz
o POSTGRESQL: postgresql-0.4.1.tar.gz
o SQLITE: sqlite-amalgamation-3.6.18.tar.gz
o SAGA: https://svn.cct.lsu.edu/repos/saga/core/tags/releases/saga-core-1.5/
o SAGA-PYTHON: https://svn.cct.lsu.edu/repos/saga/bindings/python/tags/releases/saga-bindings-python-0.8.0
o SAGA-ADAPTORS-X509: https://svn.cct.lsu.edu/repos/saga-adaptors/x509/tags/releases/saga-adaptors-x509-0.9.0/
o SAGA-ADAPTORS-GLOBUS: https://svn.cct.lsu.edu/repos/saga-adaptors/globus/tags/releases/saga-adaptors-globus-0.9.0/

Processing package PYTHON
o Downloading to /tmp/meph_tmp.501/1280492063//Python-2.6.2.tar.gz [OK]
o Extracting package
  logfile: /tmp/meph_tmp.501/1280492063//PYTHON.unpack.log [OK]
o Configuring package [./configure --enable-shared --prefix=/tmp/saga-from-meph]
  logfile: /tmp/meph_tmp.501/1280492063//PYTHON.configure.log [OK]
o Building package [make]
  logfile: /tmp/meph_tmp.501/1280492063//PYTHON.build.log^ [OK]
o Installing package to /tmp/saga-from-meph
  logfile: /tmp/meph_tmp.501/1280492063//PYTHON.install.log [OK]
```

Mephisto: SAGA Bootstrapping (cont.)

- ▣ When/where Mephisto **should** be used:
 - ▣ SAGA deployment in user space
 - ▣ Remote deployment (e.g. through batch system)
- ▣ When/where Mephisto **should not** be used:
 - ▣ If you have no clue how to use a *NIX shell (You'll have to learn that anyways if you want to use SAGA)
 - ▣ For custom-tailored, system-space deployments
 - ▣ If most of the required prerequisites are available

Deployment Status

- ▣ TeraGrid
 - ▣ SAGA is part of TG's distributed programming toolkit:
<http://bit.ly/ff9c5B>
 - ▣ CSA deployment completed
 - ▣ see <http://saga.cct.lsu.edu/software/cpp/deployments/>

- ▣ LONI (Louisiana Optical Network Initiative)
 - ▣ Part of the Cyber-tools toolkit (on all non-PowerPC machines):
<http://cybertools.loni.org/>
 - ▣ 1.4.1 available via softenv – update to 1.5.3 in progress as part of the Ganga/SAGA deployment efforts

Deployment Status (cont.)

- ▣ FutureGrid
 - ▣ under discussion, similat to TG

- ▣ EGI
 - ▣ SAGA-project is TP (MoU Signed, SLA coming)

- ▣ CERN
 - ▣ available on lxplus SL5 clusters

- ▣ LRZ (Munich)/DEISA
 - ▣ part of softenv

Outlook | Ongoing Efforts

- ▣ What we're working on right now:
 - ▣ Hardening existing codebase
 - ▣ Mechanism to create custom binary packages (RPM and DEB) for RHEL, Ubuntu and Scientific Linux

- ▣ Supporting developers to develop saga-based applications, tools and adaptors.
 - ▣ adaptors: Naregi, PSNC, RAL

- ▣ We're working with infrastructure providers in the US as well as in Europe to make SAGA part of their standard software stack.