CENTER FOR COMPUTATION
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SAGA

A Simple API for Grid Applications

SAGA Components: Installation and Deployment

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Outline

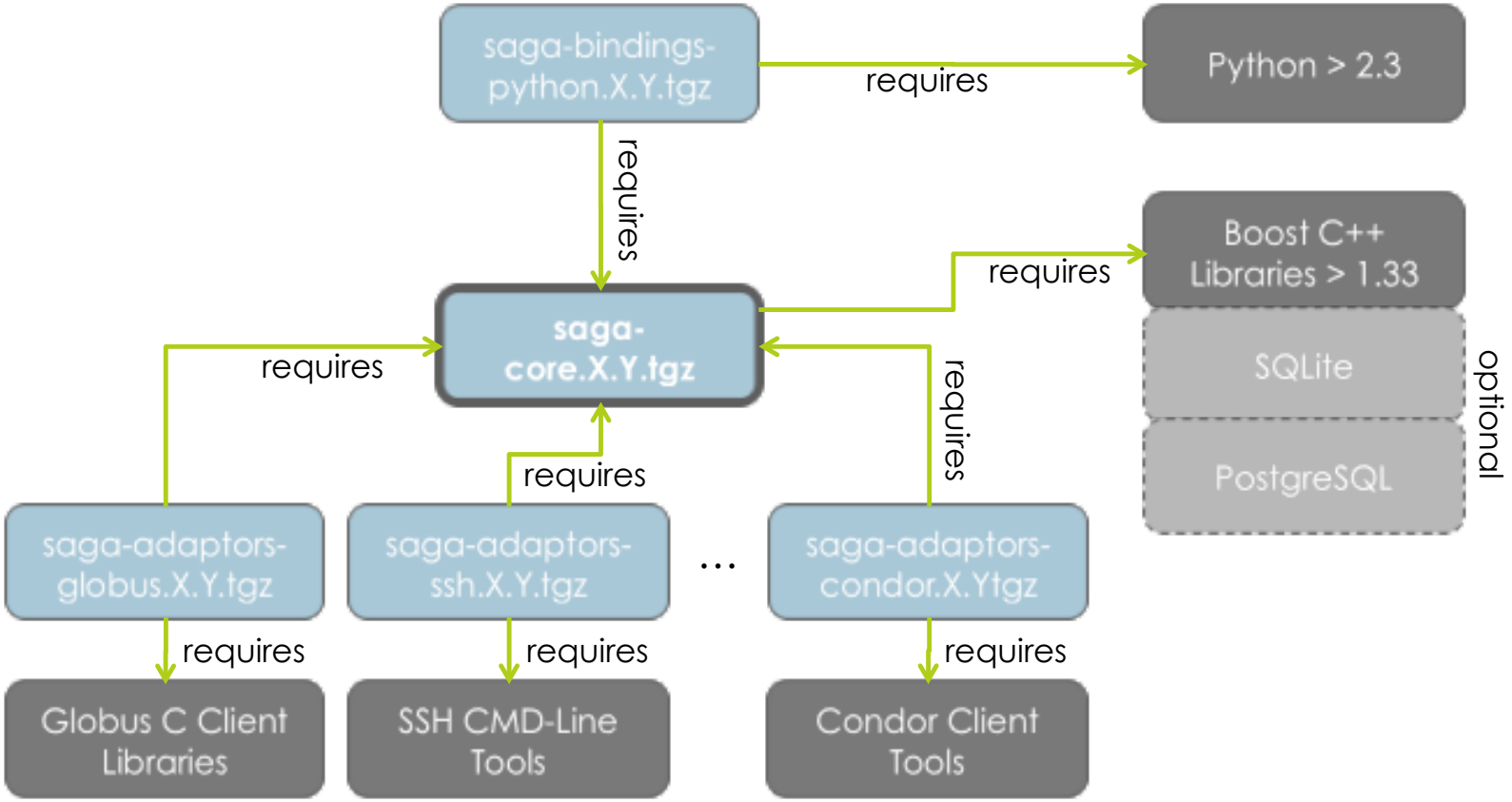
- SAGA's components
  - Overview, structure, dependencies
  - Available middleware bindings
- The SAGA build system
- Mephisto: A SAGA bootstrapping tool
- Ongoing cyber-infrastructure deployment
  - LONI (Louisiana Optical Network Initiative)
  - TeraGrid, FutureGrid
  - …
- Outlook / Ongoing efforts

SAGA

A Simple API for Grid Applications

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-**condor** (Condor jobs)
- 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

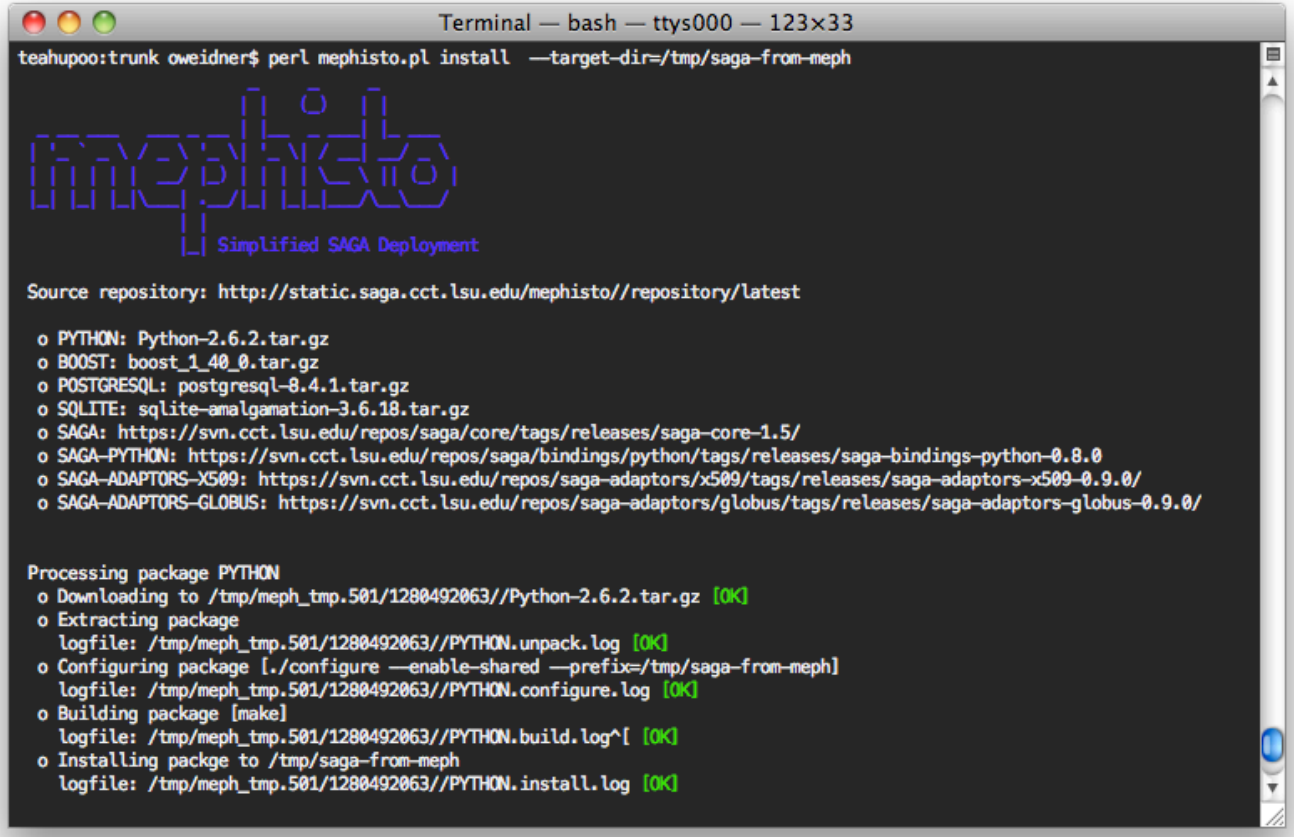
Read it!

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



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

- 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
- TeraGrid
  - SAGA is part of TG's distributed programming toolkit: http://bit.ly/ff9c5B
  - 1.4.1 available via softenv on some machines – will be updated soon
  - Users are asking for SAGA-support on Ranger and Kraken – we're working on it!

Deployment Status (cont.)

- FutureGrid
  - We're discussing possible deployment of SAGA as part of the FutureGrid HPC VMs as well as a "bare metal" deployment
- 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 and tools
- We're working with infrastructure providers in the US as well as in Europe to make SAGA part of their standard software stack.