OASIS:

OSG Application Software Installation Service

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Rationale

Open Science Grid (OSG) Virtual Organizations need to distribute application software across the grid in an easy, reliable, traceable, and secure way.

New software updates needs to be installed via an atomic operation, resulting in identical software at all sites, preferably able to roll back.

VOs must be protected from each other. VO Software Manager should be protected from themselves.

Bookkeeping/monitoring is desirable.
Rationale

The traditional mechanism (site-by-site installation jobs which write to a site-provided shared area) has weaknesses:

- Requires significant VO infrastructure to install, test, and track status site-by-site.
- No logging, traceability
- Sites may end up inconsistent
- Installations may fail, leaving incomplete software at a site.
CvmFS has proven to be a robust distributed read-only filesystem. But its' design does not focus on the content-addition process:

- Requires a knowledgable user to add content.
- Requires access management. Local login.
- No safety net.

OASIS is a job installation management system surrounding CvmFS.
OASIS: current service

Current OASIS hosted by OSG Grid Operations Center at Indiana University.

VOs are granted GSI/SSH login to a dedicated host. Access list (by DN) is managed by VOs in OIM.

VO software managers log in, install software, and issue `osg-oasis-*` wrapper scripts provided to insulate user from CvmFS commands.

Installation host separate from CvmFS host for functional isolation.

9 VOs are using the service at the time or writing this.
Oasis: current service
OASIS: new service

Version 1 issues:

- V.1 publication is synchronous. Publishing failure can lock out other VOs. No per-VO rollback.
- Auth system independent from VOMS
- Not usable by VOs with automated installation frameworks.

V.2 Features Rationale(s):

- VO separation: Multipile repos insulates VO from VO.
- Enable existing job-based (CE) installs to work unchanged, allowing existing VOs to directly switch to OASIS.
- Additional user insulation from underlying mechanism, via...
- Expandable fault-checking, installation processing.
OASIS: new service

A prototype of the new version is currently deployed and working at BNL.

When/if deployed, new service will work alongside the current login-based one in production.

Main differences are:

- Supports standard grid installation jobs via CE
- Underlying technology (CVMFS) is fully hidden from users
- User actions are wrapped to allow preparatory and post-install actions to be taken.
- General purpose and VO-provided probes (sanity checks) must be passed before publishing is done.
Oasis: new service deployment layout

GUMS → VOMS

Job
Info/Commands
FS Data

Service
FS Data
Host

OASIS
Gatekeeper
Condor Batch
OASIS Wrapper
Condor Slot

CVMFS

OASIS Service

OSG WN Clients
Oasis: new service functional flow

Start

Preparation

Installation job

OASIS Probes

Success?

YES

OASIS Probes

NO

End

Prepare local scratch install area with current content.

Probe failure triggers local scratch restoration to untouched state.

Copy scratch content to CVMFS and trigger publication.
Probes can raise a WARNING or can ABORT.

Only after passing all probes, both generic and VO specific, is the new content published.

Probes can simply inspect the new content, or

They can take actions and modify new content prior to publication.

Any arbitrary policy can be implemented. Relatively easy thanks to a plug-in probe architecture.
Examples of probes

• overquota

Checks after new content is added the VO does not go over quota.

• catalogsize

Checks the size of the CvmFS catalog(s), and creates sub-catalogs if needed.

• filesize

No file is smaller than minsize or larger than maxsize. It could accept exceptions.
Examples of probes

• nodeletion
Checks if any existing file has been deleted.

• norewrite
Checks if any existing file has been modified. It could accept exceptions (i.e. a CHAN
GELOG).

• notarball
Checks no .tar.gz file is included.

• relocatable
Ensure all binaries are relocatable, and not linked to hardcoded paths missing on the WNs.
Key features

VO isolation, user protection
Extensible, thanks to the plug-ins architecture.
Full bookkeeping via logs. Web monitor.
Easy deployment via RPM. Several options:
  - OSG-run VO repository
  - VO-run OASIS and CvmFS repo, added to OSG client configuration.