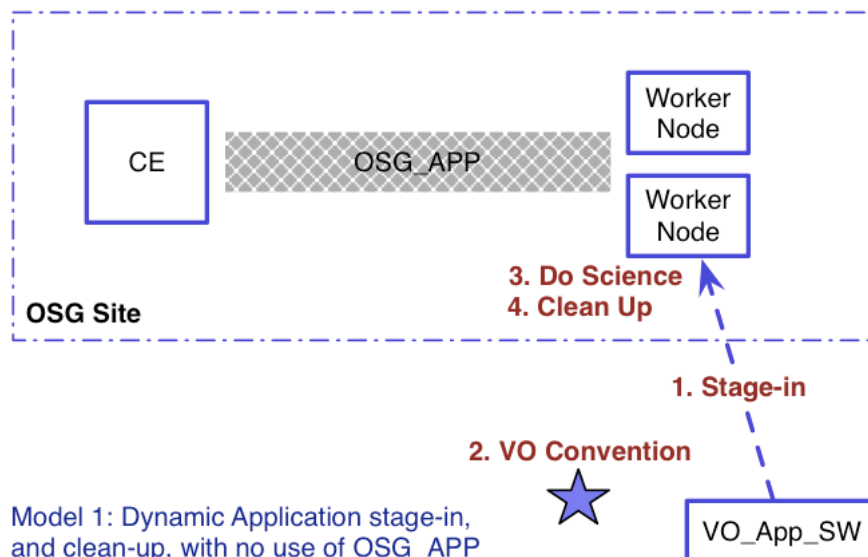
 Open Science Grid	Science Application Software Install, Advertisement and Discovery on OSG Facility: Technical Models in Usage Abhishek Singh Rana For VO Group August 2008	OSG-# put doc number from the docdb
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Different OSG Science stakeholders have different application needs, and thus, different ways of doing VO Science application software management, job execution, storage and data management on OSG.

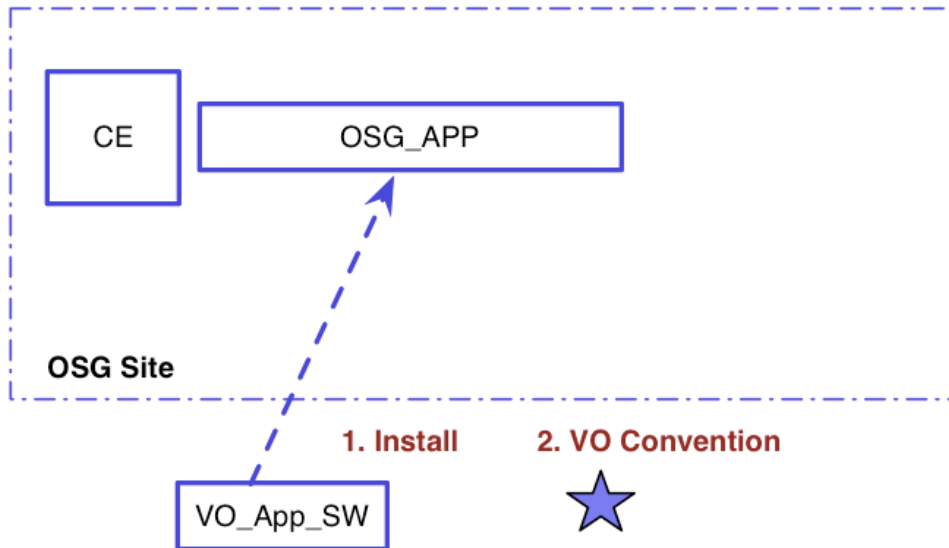
Most of this heterogeneity is by design, and expected. Nevertheless, OSG infrastructure provides many baseline services for VOs that want to make use of them. These include persistent storage area `$OSG_APP` on each site, and as information services – GIP, ReSS, BDII, etc.

This document focuses on the application software management by VOs on OSG Facility. There are 3 technical and procedural models in operation today:

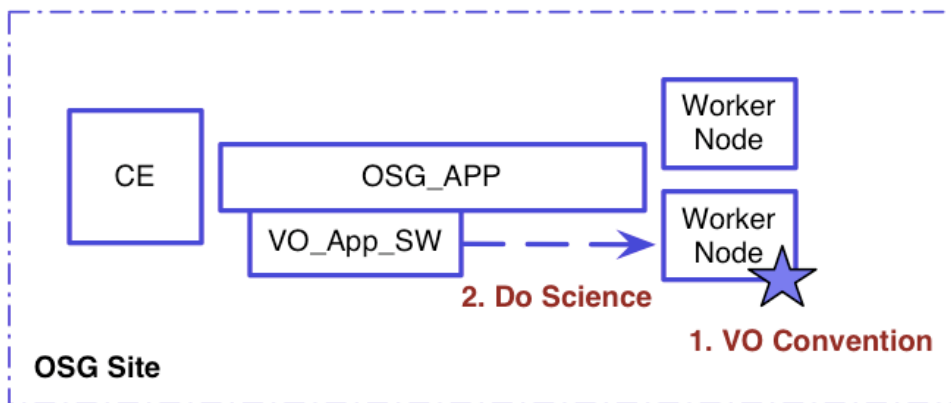
Model 1. A VO can stage-in application software/executables as well as input data, analyze, stage-out data with results, then finally clean up – without a need to have a persistent store of application software at a site and without a need to advertise or discover this information. In most common cases, each such VO uses an internal convention or a VO-specific catalog. Please note that even a VO using Models 2 and 3, e.g., ATLAS and CMS, can choose to operate this way on sites not owned by the VO. `$OSG_APP` may not be needed or used in this model.



Model 2. A VO may prefer to use `$OSG_APP/$vo_app_sw/`, maintain an internal convention or a VO-specific catalog, without a need to advertise or discover this information.

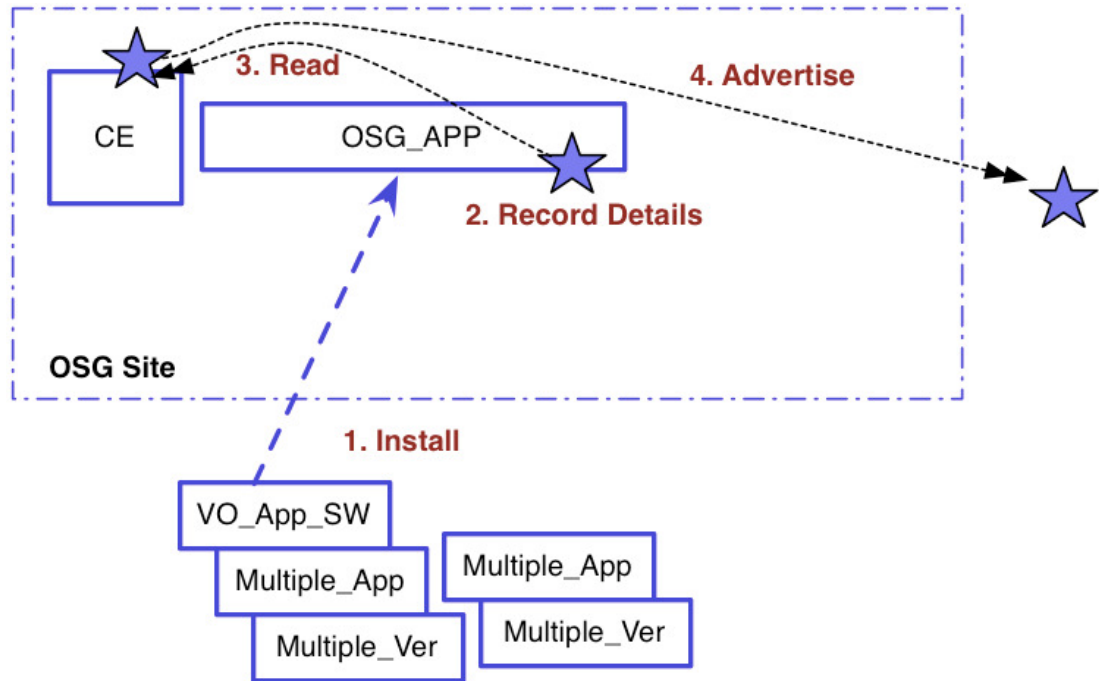


Model 2: Use of OSG_APP, with Internal VO convention.
Step I: Pre-Install of Applications by a privileged VO User.

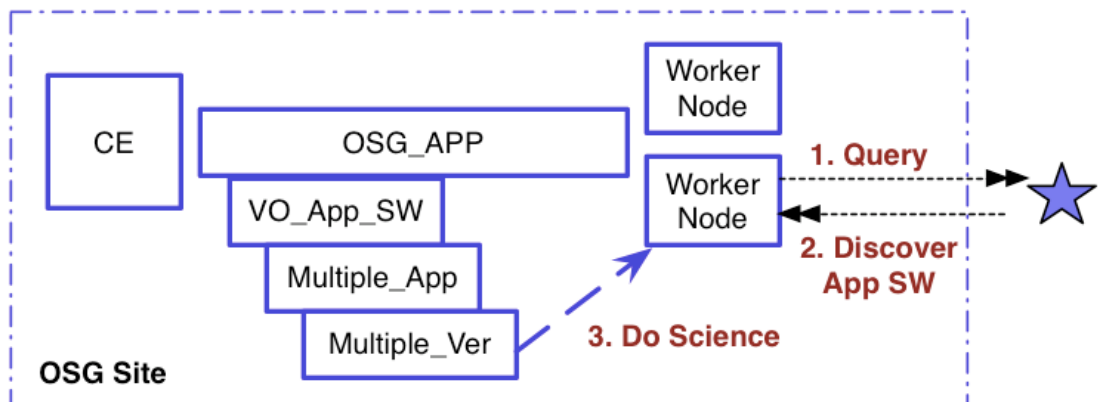


Model 2: Use of OSG_APP, with Internal VO convention.
Step II: Usage of VO Applications by VO Users.

Model 3. A few VOs, mainly on own sites, have a need to use the more complex case `$OSG_APP/$vo_app_sw/multiple_app/multiple_ver/`. Even with an internal convention, now arises a need to advertise, publish, and discover these locations at each site.



Model 3: Use of OSG_APP, with explicit advertisement and discovery.
Step I: Pre-Install of Applications by a privileged VO User.



Model 3: Use of OSG_APP, with explicit advertisement and discovery.
Step II: Discovery and usage of VO Applications by VO Users.

Today, recording of details in Step I of Model 3 is partly static – a file such as `grid3-locations.txt` has been in use. In future, if this publication can become dynamic, VOs that need it can decide to adopt it. Path forward to 2-3 dynamic solutions exists -

- (a) GIP -> (CEMon) -> (BDII) -> ReSS
- (b) PANDA and OSG WMS based Site Information Database, based on BDII.
- (c) Engage-VO's custom solution, based on ReSS classads.

Based on this classification of 3 models, below is a listing of how various Science stakeholders fit in. Please note that the same VO can use different models for different applications.

Model 1	CDF, D0, DOSAR, DES, LIGO (Inspiral Analysis), nanoHUB.
Model 2	CDF, CompBioGrid, LIGO (Einstein@Home), OSG-EDU/Education, SDSS. In past - also GADU, GROW, PRAGMA.
Model 3	ATLAS, CMS, Engage-VO.

Models 2 and 3 rely on `$OSG_APP`. OSG-EDU/Education and Engage-VO are especially frequent updaters of `$OSG_APP`, very likely due to variety in applications. Almost all VOs operating with Model 2 use internal VO-specific conventions for advertisement and discovery of installed software.

This leaves us with VOs operating with Model 3, which have a need for complex mechanisms. ATLAS and Engage-VO have informally mentioned that deprecating file `grid3-locations.txt` will have no effect – both already have a new advertisement mechanism in plans and in place. Only CMS relies heavily on `grid3-locations.txt` on OSG. Thus, we may need to carefully identify a path forward to avoid disrupting CMS operations.