

Application Contents Service Working Group

Global Grid Forum, SRM Area

Administrative Information

Name and Acronym:

Application Contents Service Working Group, or ACS-WG.

Chairs:

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Charter

Focus/Purpose

In order to install and operate complex systems such as three-tier systems more efficiently and automatically, it is necessary to specify and manage, as a unit, a diverse set of application related information. The **Application Contents Service (ACS)** provides central management of such application information. Because application contents can consist of many different artifacts it is useful to be able to bundle them into a single archive to reduce operational overhead and minimize the possibility of inconsistency. The archive must be complete to exclude the instability and/or mismatch between the contents, but can make use of the reference to the external but stable storage to improve the efficiency in transport and storage.

The importance of a standards-based Application Contents service in conjunction with a configuration and deployment service is established in the current draft of the OGSA document:

<http://forge.gridforum.org/projects/ogsa-wg/document/draft-ggf-ogsa-spec>

The **Application Contents Service Working Group (ACS-WG)** will focus on two main topics: a) Application Repository Interface (ARI), specifying repository service and its interface to Application Contents; and b) Application Archive Format (AAF), specifying archive format to register a set of Application Contents to the ACS as a unit. The Application Contents include application binaries and related information; e.g. program binaries, configuration data, procedure descriptions for lifecycle management, requirements descriptions for the hardware and underlying middleware, policy rules, and anything needed to create a task on grid systems. They may be real entities or location pointers. On the other hand, the Application Contents doesn't include information updated by a task and information describing a status of a task. ACS doesn't interpret or execute information in each content, rather it just manages them for use by other OGSA-services.

An Application Archive may include a set of software, for example, middleware and/or operating system binaries, in order to build the hosting environment required to run a job. Alternatively the hosting environment software may be provided by the system, based on the resource requirement description specified by the other elements in the Archive. The system may be provided, with the hosting environment, out of the internal pool of the various hosting environments or created on demand.

The necessity for the ACS lies within its potential for contributing to practical deployment/configuration/repository management services. Automation in the collaboration between those services, i.e. exchangeability and interoperability of application contents, is important so that the complexity of efforts do not impede grid adoption throughout industry.

Scope

There are many proprietary and open source systems that partially overlap ACS, but there is no consistent and standardized system or method which interoperates across the various platforms, languages, and services/applications in a secure and reliable way. For example, an ideal ACS would enable: exchange of the Application Contents deployable and executable among the conformant grid systems and to implement unified management operations of it on such systems.

Within the proposed group there exists extensive experience gained with one such system, the Business Grid project. The intent to promote its technologies as an open standard and/or to present its core part as open source is expressed in the project goals.

Although the ACS will be used as important service in order to implement provisioning and rich self-management capabilities, The WG does not cover these as they are covered elsewhere by the OGSA EMS design team or related WGs in GGF or the relevant standardization activities.

Goals

This group is chartered with the creation of the ACS specifications and it encourages companies and individuals to develop at least two reference implementations. We aim to complete the following specifications:

1. Application Contents Service Specification, which consists of two sub parts;
 - a) Application Repository Interface, and
 - b) Application Archive Format.

Following are the milestones of the WG:

- September 2004, GGF12:
 1. ACS charter discussion BoF was held
 2. Presented initial intent as a sample version of ACS spec.
- December 2004:
 1. ACS WG officially approved and core charter members established;
 2. Begin work through the mailing, calls and/or F2F meeting
- March 2005, GGF13:
 1. First ACS WG session.
 2. Present the straw-man specification.
- June 2005, GGF14
 1. Present the draft specification.
- September 2005, GGF15
 1. Final specification for submission to GGF Editor
- March 2006, GGF16:
 1. Preliminary reference implementations

- June 2006
 1. Two interoperable reference implementations complete

Management Issues

Evidence of commitments to carry out WG tasks

Keisuke Fukui has an exclusive assignment in his company to work on the ACS; He and his group plan to attend all GGF meetings during the ACS life span and also to hold interim working sessions (at least three times a year or on as-needed basis).

We had several people expressed their interest in working in the ACS-WG, and they are going to work closely and contribute to the ACS-WG. In particular, we have Peter Ziu (Northrop Grumman) and Thomas Studwell(IBM) as expected co-chairs, Sachiko Wada (Ascade) as a secretary; also Yuichiro Yonebayashi(Ascade); Takashi Kojo (NEC); Hiro Kishimoto (Fujitsu);. Therefore, we have representatives from five industrial institutions.

Pre-existing Document(s) (if any)

[ACS presentation]

Presentation at GGF OGSA-WG face-to-face Meeting (Interim Aug 2004):

<https://forge.gridforum.org/projects/ogsa-wg/document/ACS-presentation/en/1>

[An initial version of ACS spec]

“Application Contents Service specification (proposed draft)”,

http://www-unix.gridforum.org/mail_archive/acs-bof/2004/10/doc00001.doc

Exit Strategy

This working group is intended to have a short life span because there is already an existing system with similar functionality as a proof point. We hope to use our extensive experience in order to come up with a specification and a couple of reference implementations. We believe that we can achieve this in as early as 18 months, but not longer than 24 months.

Any other relevant information

In the last GGF OGSA-WG face-to-face meeting held during Aug. 18-20, a short presentation about ACS was given and discussed. Many comments were received and many people showed interest in this topic. The referenced presentation [ACS presentation] includes modifications that address the questions and comments I received. On slide 5, we tried to position ACS in the context of OGSA-EMS (Execution Management Service). Andrew Grimshaw and Mark Morgan of University of Virginia describe the same concept as “Actor descriptor” in their document “EMS Prototype: Solutions and Actors.”

In the Charter Discussion BOF at GGF12, we've discussed the relation of ACS with the emerging efforts Solution Installation Schema recently submitted to the W3C, inviting Tom Studwell from IBM, representing the technology. With the publication of Solution Installation Schema, IBM and others made a call to the Industry to form a workgroup to standardize an Installable Unit Deployment Descriptor (IUDD) schema that can be used throughout the Industry. We believe this schema, if standardized, may be able to be used as a base specification for the Application Archive Format. We expect the ACS WG would form a liaison with this IUDD workgroup when formed.

For the CDDL, the time slot for the BOF collided with one of their sessions and couldn't have discussion at the BOF. Instead, the Draft Charter and Initial Draft Spec. were submitted to CDDL-WG co-chairs. We got a positive feedback with some comments for improvements. The presentation material was sent to them after the BOF, too. In the

following sessions of the CDDLM-WG, they referred to the ACS as relevant activity with CDDLM.

Evaluation Criteria (from GFD-C.3)

When considering the formation of this group, the Steering Group will wish to ensure that every WG has clear and focused objectives, and has demonstrated support from the community. The Steering Group will consider the following seven issues (taken from GGF document GFD-C.3).

Is the scope of the proposed group sufficiently focused?

The group will make a survey of the state-of-the-art, write up use cases, do a requirement analysis and create recommendations documents. The proposed standard will consist of two parts;

- a) Application Repository Interface, and
- b) Application Archive Format.

Although the ACS will be used as important service in order to implement provisioning and rich self-management capabilities, The WG does not cover these high-level capabilities specifications. They may be covered by the OGSA EMS design team or related WGs in GGF or the relevant standardization activities.

Are the topics that the group plans to address clear and relevant for the Grid research, development, industrial, implementation, and/or application user community?

The topics proposed are very relevant for the Grid research, in terms of many open development, industrial, implementation and application user community. To accelerate the development and implementation of the commercial or industrial level of grid system, common interface and model for simple and consolidated management of the Application Contents are of great importance. The standard will contribute to interoperability and exchangeability of the Application Contents between OGSA based grid systems. Also, it will enhance the overall efficiency and expand the scalability of the grid systems. Those, in combination, will ensure compatibility and reusability of the Application Contents through evolutions of the each grid system over time.

Will the formation of the group foster (consensus-based) work that would not be done otherwise?

Exchangeability, interoperability and stability of the Application Contents are important. Although there are many products that support automatic deployment of Application Contents, they don't focus on deployment in the manner that OGSA envisions; some use the J2EE mechanism, some use proprietary and/or undisclosed methods, which limits their usefulness to a small number of systems. Implementations tend to customize, augment and trim the feature set based on their specific demands. The standardization needs to aggregate the various aspects of the demands for those related technologies. The ACS aims at enabling exchangeable, interoperable and stable handling of the Application Contents defining a standard interface to the Application Repository and common format for Application Archive.

Do the group's activities overlap inappropriately with those of another GGF group or to a group active in another organization such as IETF or W3C?

The CDDL-WG covers the generic part of deployment and focus on the models of management. They focus on, for example, unified definitions of configuration parameters to

replace or mask the many different configuration notations and access mechanisms in use today (e.g. XML, ini files, SQL); methods for validation of configurations at definition- and run-time; system composition from sub-systems; separation of concerns of functionality and configuration; auto-discovery, self-monitoring, etc. ACS manages and provides access to the deployment contents used by CDDLM services.

In the Charter Discussion BOF at GGF12 and the following discussions, we've discussed the relation of ACS with the emerging efforts Solution Installation Schema recently submitted to the W3C, inviting Tom Studwell from IBM, representing the technology. We believe a formal workgroup to standardize a schema for Installable Unit Deployment Descriptor will be announced shortly. We believe this schema, if standardized, may be able to be used as a base specification for the Application Archive Format. We expect the ACS WG would form a liaison with this IUDD workgroup when formed. We agreed to have follow-up meetings to discuss about consistency further and will develop standard archive format. ACS WG will also work on the Repository Interface standard considering the consistency with archive format.

Are there sufficient interest and expertise in the group's topic, with at least several people willing to expend the effort that is likely to produce significant results over time?

The concept of the ACS was invented and developed by the Business Grid Computing Project in Japan. The project prototyped and evaluated the benefit of this concept. In order to achieve interoperability across multiple grid systems, the project recognize the necessity of the standards specification and decide to make proposal to the GGF.

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Does a base of interested consumers (e.g., application developers, Grid system implementers, industry partners, end-users) appear to exist for the planned work?

"Business Grid Middleware Goals and Status", January 20, 2004, Hiro Kishimoto, Fujitsu
Takashi Kojo, NEC Fred Maciel, Hitachi

http://www.globusworld.org/program/slides/3c_1.pdf

"Services Computing: Grid Applications for Today", Liang-Jie Zhang, Haifei Li, and Herman Lam

<http://www.computer.org/itpro/it2004/promo1.pdf>

Japanese Business Grid Consortium, a group jointly funded by its industrial members and the Japanese Ministry of Economy, Trade, and Industry is developing Grid middleware based on GGF OGSA and to be conformant to relevant GGF WG specifications, and the Application Contents Service is one of its key capabilities.

"OGSA Interest", R2AD, LLC & Northrop Grumman

<https://forge.gridforum.org/projects/ogsa-wg/document/r2ad-ngms-ogsa-intro/en/1>

Peter Ziu at Northrop Grumman expressed participation to the standardization. Mike Behrens of R2AD showed interest in ACS, too. They referred ACS in their joint presentation at the last OGSA-WG F2F in August.

Some other of the commercial product vendors showed interests in the targeted standard, in order to make their products conformant to open standards. We would like to call for interested parties from broader range.

Does the GGF have a reasonable role to play in the determination of the technology?

GGF is attracting expertise in relevant technology areas, such as CDDL-WG and OGSA-WG, and will provide with the best chance to give coordination to those during the discussion of the Application Contents Service standardization process as the ACS-WG.