Grid Application Meta-Repository

- Repository interconnectivity and cross-domain application usage in distributed computing environments -

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Outline

- Introduction
- Motivation
- Objectives
- Grid Application Meta-Repository System
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- Summary
- **Grid application**: an application executed in a Grid computational environment

- **Repository**: stores objects in a structured manner, following a model defined by the repository administrator. The repository provides functions for classification, storage, management and retrieval of the components stored inside

- **Grid Application Repository (GAR)**: A repository of Grid applications
Motivation

- The number of Grid applications has been increasing rapidly in recent years → Application Repositories became a necessity

- Grid applications are suitable not only for Grid but also for other similar distributed computing paradigms (e.g. cluster computing, cloud computing) and new technologies (e.g. virtualization) → GARs can be operated in connection with other distributed computing technologies
Objectives

- GRID APPLICATION REPOSITORY ARCHITECTURE:
  - connect any type of GAR (different implementation technologies, methods of access and authentication, communication protocols and transport protocols)
  - make applications accessible to other OGSI/WSRF Grid Services
  - expose the applications to web search engines

- GRID APPLICATION REPOSITORY MODEL:
  - uniformity in presentation of Grid applications
  - a comprehensive description of an application along with a suggestion for a new categorization of application-related objects
  - compatibility with newly emerging technologies (virtualization, automatic virtual machine creation, cloud computing and automatic service deployments)
Grid Application Meta-Repository System
Implementation
Implementation

Digital Repository
Application Assets
  › Collection Description

‹ Items in this Collection  1/4 of 4

Installation Notes  Source Code  Test Suite  Virtual Machine

Digital Repository
Source Code

Detailed List of Content

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Implementation

VIRTUAL MACHINE

GAMRS

VM SERVICE

CLOUD / HYPERVERSOR GATEWAY

VIRTUAL MACHINE STORAGE
Implementation
Summary: Architecture

- Connect together any type of Grid Application Repository
- Applications accessible to other OGSI/WSRF Grid Services
- Applications easily discovered through web search engines
- Exchange and reuse application metadata and objects

- Can function as a remote “publisher” for connected repositories supplying different connectivity interfaces for them (e.g. user - web search engine – GAMRS HTTP/REST - NGS AR)
- Architecture can be cascaded, connecting multiple GAMRS architectures → federation; failover; backup
**Summary: Repository Model**

- **More comprehensive** description of an application than traditional models
- Ability to describe different application **providers**
- **New categorization** of application-related objects: description documents, binaries, source code, libraries, software dependencies, documentation, test suites, licenses, virtual-machines, hash sums

- **New application-related objects** make GAMRS usable in scenarios involving new technologies (e.g. virtualization, cloud computing)

- Ability to store **VM-embedded** applications → deployment made easy: no prior knowledge on OS installation procedures, application installation procedures, software dependencies or configuration of the application
THANK YOU!