

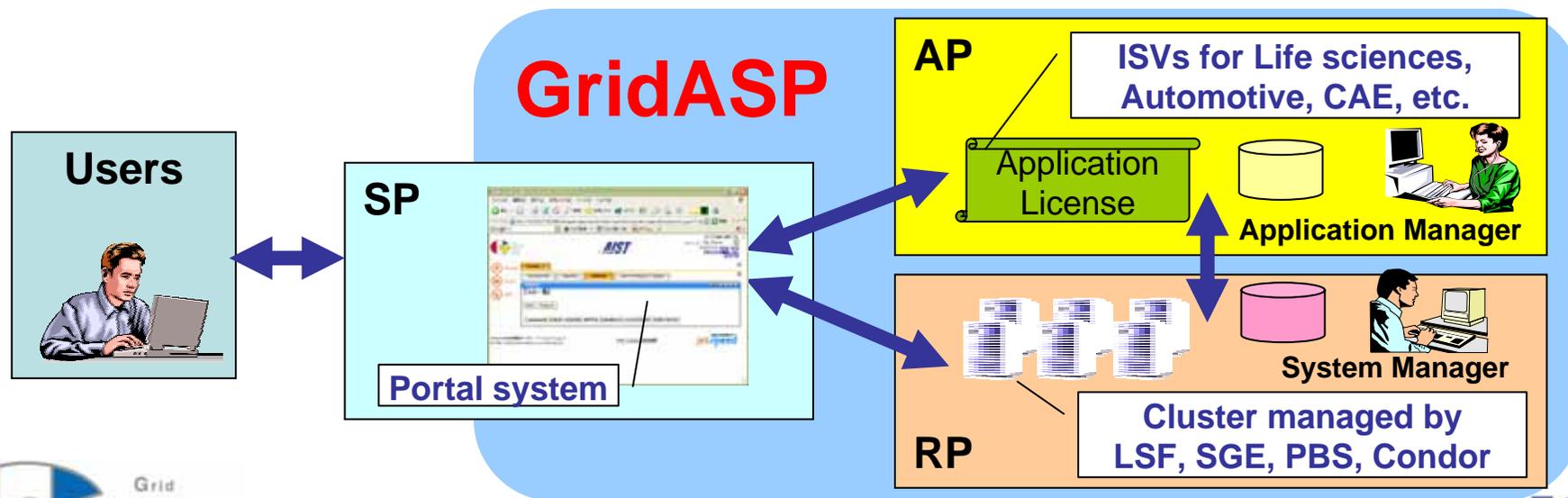
GridASP :

An ASP framework for Grid Utility Computing

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1.2 Abstract/Summary

- The GridASP is a utility computing framework for technical computing in the enterprise.
- The concept of the GridASP is to separate the function of ASP (Application Service Provider) into three independent providers.
 - ▶ resource provider (RP)
 - ▶ The Application provider (AP)
 - ▶ The service provider (SP)



1.3 Keywords & 1.4 Category

1.3 Keywords

- ▶ ASP, Virtual organization, technical computing in enterprise, utility computing

1.4 Category

- ▶ Define taxonomy to categorize this use case
 - Scope: Business model and infrastructure, tool
 - Organization Type: Enterprise
 - Deployment type: Inter-Organization
 - Production status: Experimental
 - Existing implementation: Implementation available

1.5 Perspective (1)

1.5.1 Individual

- ▶ End user

The end users are very important for this model, because end users belong to the different organization from providers.

- ▶ Infrastructure Manager (RP)

The infrastructure Manager manages the IT resources in RP. IT resources are mainly constructed as cluster systems and are managed by cluster management tool (batch queue system software) such as LSF, PBS, SGE, Condor.

- ▶ Application Manager (AP)

The application Manager prepares application packages including executable binaries and installation/un-installation scripts.

- ▶ xxxxxxxxx (SP)

There is a business person who sell the application execution services to the end users. But it is not on the template list, so I dropped it from the document.

1.5 Perspective (2)

1.5.2 Organization

- ▶ Seller (software, hardware)

The AP and the RP are sellers of usage about software and hardware, individually. The RP is managed by the infrastructure managers. They received the end user's request for job submission through the SP.

The AP is managed by the application managers. They prepare application packaged and manage application licenses.

- ▶ Solution provider

The SP is a kind of solution provider for enterprise users. The SP manages grid portal for application job execution environment.

1.5.3 Industry classification

- ▶ Technical computing in the enterprise. For instance, pharmaceutical, financial, automobile, aerospace and semiconductor are typical segments. However, target is not restricted in these segments.

1.5.4 Application Type

- ▶ CAD in manufacture, CFD in aerospace, collision analysis in automobile, Risk analysis in financial computing, are typical target applications.

1.5.5 Expectations

- ▶ From the end user's point of view, usage is changed.

using in-house computing system -> outsourcing application execution

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1.6 Motivations & Goals (1)

1.6.1 Problems (In the case of ASP)

- ▶ The providers need to prepare all of components for ASP, such as applications, computing resources, and the portal systems. It takes long term and need large investment to start the business.
- ▶ The system is constructed for pre-determined applications. If the requirement for the applications is not so many, resources will not be used so much and the income will be small.
- ▶ If the requirements of users are a lot, the computing resources may not be enough to execute all of the requested jobs.
- ▶ The providers need to recognize who is requested the jobs and what is the input/output data. However, some of end users, especially such as pharmaceutical company and financial company, do not want to be known by the providers.

1.6 Motivations & Goals (2)

1.6.2 Benefits or Value (In the case of GridASP)

- ▶ The providers need to prepare at least one of the components, applications, computing resources and the portal systems. It is easy to start the business without taking long term and needing large investment.
- ▶ The RP can contract with several SPs. Even though one of the SPs does not have many requests, the remaining SPs can send the requests to the RP. So, the applications are need to be dynamically deployed.
- ▶ The SP can contract with several RPs. If the SP has the many requests, they can be distributed those RPs.
- ▶ The SP needs to recognize who is requested the jobs and the RP needs to recognize what is the input/output data for the computation. The RP can not recognize the end user, if the SP uses anonymous ID for the delegation to the RP. The SP can not recognize the input/output data, if the encryption system is shared by the end users and the RP.

1.7 Scenarios

- The actors are the SP, the AP, the RP and the end user.
- The end user requests the job through the grid portal (SP). SP submit the job to the RP. The results of the job are transferred to the end user through the SP.
- The AP prepares the application packages including executable binaries and the installation (un-installation) scripts. The packages are registered to the SP and the infrastructure manager in the RP downloads the packages from the SP and executes the installation script. Then the application is deployed.
- When the end user uploads the input file to the SP, the input file is automatically encrypted. The encrypted file is transferred to the RP and is decrypted in the storage area at the RP. After executed the job, the results will be transferred to the end user in the same encryption method. Furthermore, when the SP transferred the job to the RP, the user ID is replaced by an anonymous ID. Thus, the RP does not know who the actual end user is.
- The grid technologies are used to federate three independent providers
- The RP is virtualized beyond the portal system. The end users do not need to know which resource companies executed their jobs. The RP removes the all of information after the results are transferred to SP.

1.8 Standards

- In the business model of the GridASP, independent providers need to be federated each other. The interfaces between them are necessary to be interoperable.
- The job submission interfaces are being standardized in the JSDL-WG.
- But the information services about the resources including accounting information are not established yet. In order to establish the federation of providers, those standardization are necessary.