An Autonomic Service Discovery Mechanism to Support Pervasive Device Accessing Semantic Grid

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Research Background

- We are doing a project of integrating pervasive devices into Grid environments

- An challenge: how a pervasive device locate, find, select and invoke an appropriate Grid services in a resource (service)-rich environment?

- Bring semantic web technologies to Grid services to build a dynamic Grid service discovery mechanism
Semantic Web Technology

- Semantic web is a universal medium for the exchange of data, a facility to put machine-understandable data on the web, and a place where data can be shared and processed by automated tools as well as people.

- Semantic Web develops a set of languages, e.g. RDF and OWL, to address the problem of XML lack of semantics.

- OWL-S is an ontology, providing a standard vocabulary to create service description to support automatic service selection and service composition.
OWL-S Upper Level Ontology
Grid Service Description

OWL-S class diagram for Grid service description ontology
Grid Service Discovery

Two essential points:

- **Separation between Grid service implementation and description**
- **Users describe service request with terms from the same semantic model used to build Grid service description**
Two schemes are considered in our Grid service discovery mechanism:

- Traditional “Discover + Match” Scheme
- Dynamic Service Composition Scheme
Architecture of Grid Service Discovery Engine
Implementation and Evaluation

System Framework
Thank You!