Towards Dynamic Composition of Adaptive Services

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Motivation

How to handle:
- An increasing heterogeneity and complexity in today’s networking, wide area distributed computing and service provision not only due to technology, but also due to the large number and widely differing participants in the area.
- Dynamic resources and services in terms of dependability, availability, performance, capabilities, security, costs and QoS.

IDEA AND VISION

- A Research Project which aims at development of a technology that allows independent participants in a global-scale network to provide resources and services as well as to dynamically compose services from available network resources and services.
- It integrates well-established technologies of:
  - The Semantic Web — for precise and unambiguous service descriptions,
  - Grid computing — for distributed resource sharing in a dynamic, heterogeneous environment, and
  - Plug-and-Play architecture — for adaptive service (re)configuration, deployment and execution.

Multiple Roles of Participants and the Major Types of Capabilities

Adaptive Service Scenario and Lifecycle

Service Definition

DAML-S Service Profile
(Semantic Description of the Service)

- a) High-level descriptions of a service and its provider.
- b) Profile attributes.
- c) Functionality Description.
- d) Extension to ServiceProfile for description of Capability, QoSCharacteristic and AccessPolicy.

Service Realisation Model

Service Composition Definition
A service as a composition of multiple services

Service Implementation Definition
Using P2P Execution Platform

WSL Service Interface Description
(Defining service invocation mechanism)

Dynamic Service Instantiation and Configuration in P2P Systems