DOMAIN 2: MASSIVELY DISTRIBUTED SERVICES

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Agenda

- Rational
- “Domain 2” definition
- Architecture
- Roadmap
Enterprisewide SOA is Federated, Multi-owned and Multi-layered

Federated SOA is the pre-requisite for a successful, enterprise-class cloud strategy

Federated SOA

- Build on SOA domains that may exist within corporate boundaries or may be a set of external third-party services
- Top three Federated SOA requirements
  - Federated identity
  - Inter-domains protocol interoperability
  - Message Hygiene

Federated SOA: A pre-Requisite for Enterprise Cloud Computing
http://weblogic.sys-con.com/node/1233457
The Myth of Open Web Services - The Rise of the Service Parks

Charles Petrie • Stanford University
IEEE INTERNET COMPUTING

A few companies are establishing Web service communities that constitute industrial service parks that offer sets of Web services with their own sets of rules for combining and modifying them.

- Each service park will have sets of business objects that provide the semantics.
- Each will have its own technologies for combining services and for letting consumers modify them somewhat.
- Each will likely let external service providers play in the park if they follow the rules.

Park owners govern the services, their consumption, pricing models, and composition.
Domain 2: Massively distributed services

Goal: to build a combined public/private cloud PaaS leveraging existing distributed ESB technology

- Hybrid cloud

SOA4All federated distributed service bus as a starting point

- Build on Petals ESB and ProActive
- Highly distributed service architecture
  - Set of domains linked through a dedicated protocol
Domains become clouds

SOA4All federated distributed service bus build on two layers:

- A federation of distributed SOA domains for service invocation and message routing
- A P2P shared space that stored information about services

→ Service virtualization

Main idea is to link with a resource virtualization technology

→ Next generation hybrid cloud
Domains become clouds: Advantages

Possibility to add dynamically new domains/clouds
- Heterogeneity management
- Interoperability

Easy service deployment
- Distributed service container

Mix of public / private cloud
- End to end QoS
- In-house integration + public services
  - Integration as a service
Domains become clouds: Scientific / technical challenges

**Elasticity**
- On-demand service scalability

**Interoperability**
- Federation protocol / API standardization
- Heterogeneous technologies and policies management

**Governance**
- Large scale distributed registry
- QoS enforcement

**Security**
- Identity management
Architecture / Technologies

SAAS
- Governance
- Monitoring
- Management
- BPM

PAAS
- Orchestration / composition / choreography
- Federation protocol

IAAS
- Distributed Service Bus

Resource virtualization
- ProActive
- OpenNebula
- OpenStack

Frascati
Partners

Petals Link
ActiveEon
INRIA
  • OASIS
  • ADAM (tbc)
Fokus
USP
Resources: Collaborative projects

SOA4All

- To setup a semantic service infrastructure that scale at the Internet level providing large enterprises, SMEs, and end-users the possibility to engage as peers within a network of equals
- OW2 members: INRIA / ProActive, Petals Link

CHOReOS

- Large Scale Choreographies for the Future Internet
- OW2 members: INRIA / Arles, Petals Link, USP

PLAY

- Elastic and reliable architecture for dynamic and complex, event-driven interaction in highly distributed and heterogeneous service systems
- OW2 members: Petals Link, INRIA / ProActive, FT labs sofia

SocEDA

- Cloud based platform for large scale social aware Event Driven Architecture
- OW2 members: Petals Link, Activeeon, INRIA / ProActive, FT labs sofia
Roadmap

Scope: partners & technologies
  - Who is interested?

Business agreement
  - What is the target business?

Architecture definition
  - Which technology components?

Interoperability protocol definition
  - Protocols & API

1st prototype development & assessment (mid 2011)
  - Validation on a technical Use-Case
Distributed Interoperability Architecture

Massively distributed services

Distributed and federated SOA for cloud
Recommendation 1

- The EC should stimulate research and technological development in the area of Cloud Computing
  - Particular research topics to be addressed further are: (1) Elastic scalability; (2) Cloud (systems) development and management; (3) Data management; (4) Programming models and resource control; (5) trust, security and privacy.

Recommendation 2

- The EC together with Member States should set up the right regulatory framework to facilitate the uptake of Cloud computing
  - (1) Economical aspects; (2) Legalistic issues; (3) Green IT.

Challenge 1: Pervasive and Trusted Network and Service Infrastructures

Objective ICT-2011.1.2 Cloud Computing, Internet of Services and Advanced Software Engineering

a) Cloud Computing

- Intelligent and autonomic management of cloud resources, ensuring agile elastic scalability. Scalable data management strategies, addressing the issues of heterogeneity, consistency, availability, privacy and supporting security.
- Technologies for infrastructure virtualisation, cross platforms execution as needed for service composition across multiple, heterogeneous environments, autonomous management of hardware and software resources.
- Interoperability amongst different clouds, portability, protection of data in cloud environments, control of data distribution and latency.
- Seamless support of mobile, context-aware applications.
- Energy efficiency and sustainability for software and services on the cloud.
- Architectures and technologies supporting integration of computing and networking environments; implications of Cloud Computing paradigm on networks
- Open Source implementations of a software stack for Clouds

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