Virtual Organizations: a Business Perspective

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Virtual Organisations And Grids 2006
Current State and Future Development

(Today) Static Integration

Inter-Enterprise Workflows

(Target) Dynamic Integration

Service Orchestration and Choreography

Enterprise Resource Planning

Intra-Enterprise Co-operation

Collaborative Business

Virtual Organizations (VO)

Single Database

Distributed Processes (in-house)

Collaborative Processes (B2B)

Transient Collaborative Processes (B2B)
Core of Businesses: Services

- Simple services solve a problem on their own
- Complex services may combine the functionality of several simple services
- Services have explicit or implicit relationships
- Relationship may be static or dynamic
- Services use resources to deliver its capabilities
Virtual Organization

Characteristics:

- Are formed to support some set of business processes
- Combine different services from different participates
- Are usually backed by some form of formal contract
- Are defined on different organizational levels
  - Agreement to collaborate on the defined level
  - Each participant (service) gets access authorizations from other participants (services)
- Not limited to infrastructure (no simple sharing)
eScience Grids vs. Business Grids

**eScience Grids**

... SW landscape
- collections of batch jobs
- automated batch processing by task bag abstraction
- file-based

... size
- targeting the world-wide thing

... job characteristics
- stateless batch jobs
- highly mobile

**Business Grids**

... SW-landscape
- interactive and batch jobs
- middleware (Web-/Application Servers,...)
- database-based

... size
- a few administrative domains

... job characteristics
- stateful services and jobs
- restricted mobility (licensing)
eScience Grids

... data characteristics
- relatively flat data structures
- no transactional data

... Service Level Agreements
- performance isolation of individual applications
- often best effort approach (get it done at all)

... don’t care about legacy

... main drivers
- get the compute power
- get it done at all/quicker

Business Grids

... data characteristics
- highly structured data
- transactional data (OLTP)

... Service Level Agreements
- need for performance isolation across applications, middleware
- isolation within and across basic resources

... legacy support is a must

... main drivers
- improve administrative flexibility
- get it done efficiently (cost vs. customer-specific quality)
Organization may use resources and services provided by another organization to deliver as service

Treating underlying resources as a case of a service
Enterprise: single administrative domain
- Might include several departments
- Common set of management policies
- Might span multiple countries (legislative domains) and may have different local legal requirements \( \Rightarrow \) potential problems of resource/service usage
- Reality: consistent subset of administrative rules that comply with all legislative domains

☞ Sharing of enterprise resources without major restrictions
Subsets of two Enterprise Grids overlap

- In most cases only a subset of the overall grid within an Enterprise is likely to be contributed to a VO
- Contracts in business usually between two parties
- “Add one by one to the VO”
- Two kinds of inter-organization relationship
  - Master/Slave
  - Peer-to-Peer
Hosting – a special case of a Virtual Organization

Today

- Hosting is static by using pre-allocated resources
- Allocation for a long period of time (weeks, months, years)
- Billing is relatively easy

Future

- Dynamic hosting
- Short-term allocation (minutes)
- Allocation on demand with some real-time functionalities
- More advanced billing and accounting mechanisms required
More complex inter-relationships are possible

Diagram:
- Departmental grid
- Dynamic hosting
- Enterprise grid
- Hosting grid
Some example Scenarios (IT perspective)

Mergers & Acquisitions

Enterprise Grid A  Enterprise Grid B  Enterprise Grid A  Enterprise Grid B

Evolves over time

Enterprise AB
Some VO Requirements

- **Functional:**
  - Reliable and secure accounting and billing
  - SLA monitoring and penalty management

- **Security:**
  - Strongest security and isolation
  - Strongest protection against external threats

- **Performance:**
  - Highly efficient operations (virtualization technologies)
  - Prediction and enforcement of performance characteristics (SLAs)

- **Manageability:**
  - Remote infrastructure management
  - Mass automation

- **Flexibility:** on-demand and with migration of services
Thank you!

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