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ANSA Phase III

TINA 93 Panel: The Challenges of Being Open

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Abstract

A set of slides for a panel session at the TINA 1993 Workshop.

The slides discuss the concept of federation and how federation contracts are negotiated across enterprise boundaries.

The aim of the talk is to highlight a list of open research issues..

APM.1067.00.02

Draft
External Paper

10 February 1994

Distribution:
Supersedes:
Superseded by:

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The Challenges of Being Open

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What is OPEN?

- **ENTERPRISE: people and resources within a BOUNDARY**
- **OPEN: the ability to exercise autonomy within the enterprise WHILST interworking with other enterprises**
- **OPENESS means bridging boundaries, not abolishing them**
- **Understanding what happens at the boundaries is crucial**

Boundaries

- **Boundary defines the scope of some set of POLICIES**
 - **Organizational, Accounting, Judicial, Economic,**
 - **Contractual, Social, Political, Cultural**
 - **Technology (generally as a consequence of non-technical policies)**
- **Boundaries are not static**
 - **Organizations split, merge and restructure**
- **Technical boundaries should always be transparent, administrative boundaries should be selectively transparent**



Authority

- **The concept of AUTHORITY enables us to understand relationships at BOUNDARIES**
- **MONOLITHIC: single agent**
- **HIERARCHICAL: single control authority, multiple agents (in space and time)**
 - based on **DELEGATION**
- **FEDERATED: multiple design authorities, multiple agents**
 - based on **AGREEMENT TO CONVENTION & DELEGATION**



Federation

- **Real-world systems are federated, therefore information systems should also be federated**
- **Federation rules**
 - a member cannot be forced to do anything by another member
 - a member has freedom of association and disassociation
 - a member determines what it shares with other members
 - a member determines how it will view and use whatever is offered by the others
- **FEDERATION implies CONTRACT**
 - disputes have to be resolved outside the federation



Technical Aspects

- **How can we establish a boundary?**
- **How do we monitor / control interworking across a boundary?**
- **How can we move a boundary?**
- **Using identical standards either side of the boundary simplifies the problem, but doesn't make it go away**
- **Boundaries imply INTERCEPTORS - how can we exploit them?**

Interception

- **To build an interceptor we need to know:**
 - the way in which the service is invoked (methods, information flows, QoS)
 - what naming conventions are used
 - the properties associated with the service (owner, location, ...)
 - the technology it requires for interaction
 - how the service expects to be managed
 - how the service expects access control to be done
 - how the service expects accounting to be done
- **These are elements of a CONTRACT between service user, service provider and service bearer**



Contract negotiation

- **Because we don't know how to formalize a lot of these we resort to using NAMES**
- **This doesn't federate, because name spaces grow independently**
- **It doesn't scale because the name space becomes enshrined in the system**
- **Priorities**
 - **Develop representations for all aspects of a contract**
 - **Develop means to do compatibility checking of contracts**
 - **Develop means to interwork with name-based checking and support for name mapping**



Naming

- **Autonomy implies context-relative naming**
 - **check out context-relative naming works “all the way down”**
 - **develop conventions to reduce complexity of naming systems**
 - **develop ways of manipulating name spaces as structures independent of syntax (e.g. as in OMG JOSS Naming Service)**
 - **develop tools to manage and optimize name spaces**



Properties (e.g. as used in Trading)

- **Properties must be mapped at boundaries**
- **This is a name correspondence problem**
- **It is the problem of interconnecting independently developed object repositories**
- **Scope for deductive reasoning tools operating on information models**



Interconnection

- **Protocol and addressing boundaries can be hidden within an ORB**
- **Protocol converters and routers can be located at boundary, or in individual nodes**
 - **interception at boundary enables control and monitoring**
 - **interception at boundary enables protocol evolution**
- **How can we automatically instantiate interceptors as service users and providers establish bindings?**
- **How do contracts relate to the binding process?**
 - **which parts of the contract are used when?**



Management

- **How to get around policy conflicts?**
 - e.g. pay as you go versus pay in advance
 - delegation issues
- **How do we model policies?**
- **How can we do wholesale management?**
 - move all red objects from Cambridge to Ipswich
- **How can we do wholesale security?**
 - e.g. Clark-Wilson model - approved transactions rather than subjects, objects and ACLs