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## ANSA Phase III

# November 93 TC presentation - Object Compatibility in Federation

Yigal Hoffner (and David Iggulden)

### Abstract

These slides have been generated from notes prepared by Yigal Hoffner with some additions and interpretation by David Iggulden

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1 November 1993

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# **Object Compatibility in Federation**

**(Work in Progress Report)**

**Yigal Hoffner**

**(Presented by David Iggulden - Business Unit)**

**Federation Group**



*Base  
Technology*

**Database  
Technology**

**Platforms**

**Trading &  
Config Mgt**

**Distributed  
Environment**

**Tools**

*Study*

**Data Management**

**ORBs**

**Spec Svc  
Components**

**Service  
Description**

**Object  
Compatibility**

**Micro-  
Scenarios**

**Tools**

*Design*

**Data Mgt  
& ANSA**

**Experimental  
Spec Svc  
Design**

**Federation  
Architecture**

**Auto Trans  
Architecture,  
Approaches**

**Distributed Appli-  
cation  
Design Guide**

*Integrate*

6/94

**Experimental  
Spec Svc  
Implementation**

**Experimental  
Encapsulators,  
Interceptors**

*Resolve*

**Federation  
Engineering  
Model**



## Objective of the Federation work

- **to provide a coherent story of trading, configuration management and interception**
- **it will do this by**
  - **reviewing the limitations of current models**
  - **making all assumptions explicit**
- **and by building upon past experience of, e.g.**
  - **Client/Server model**
  - **ANSAware practice**
  - **Communications/RPC**
  - **IDL/tools**



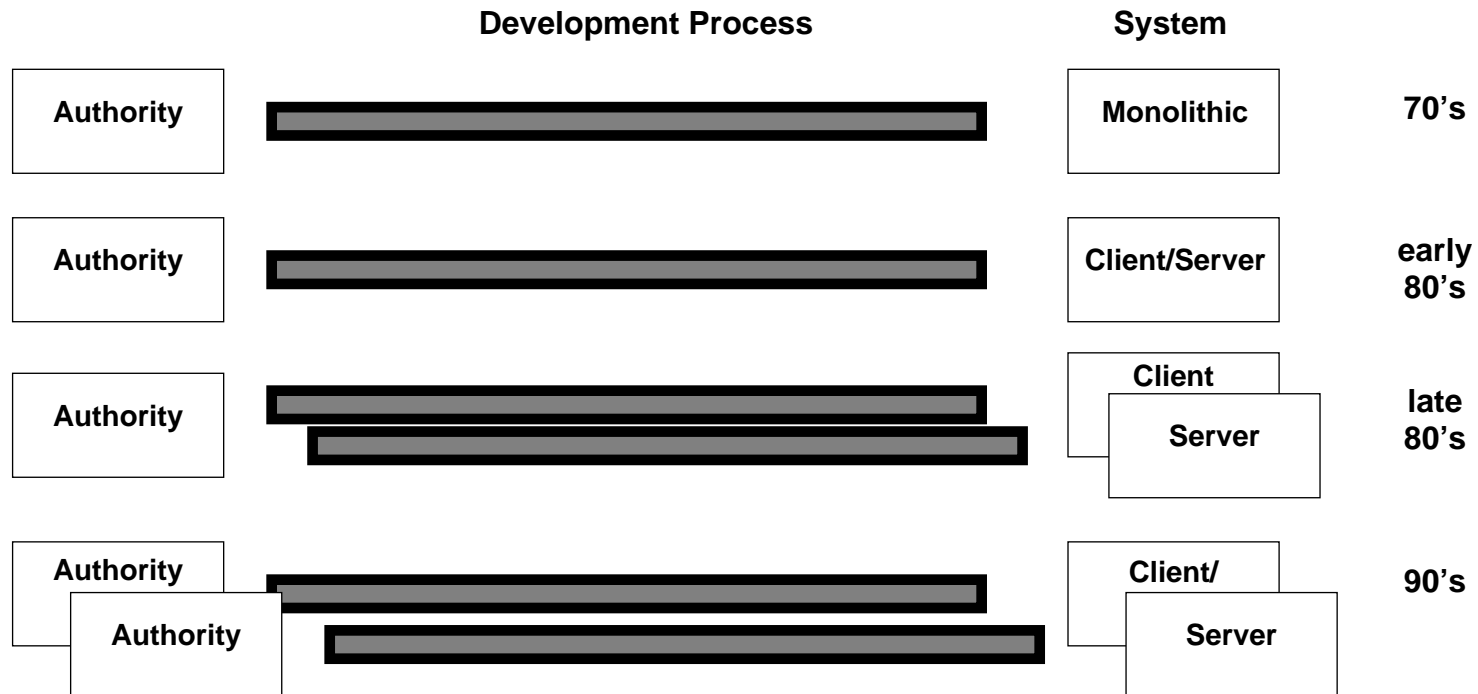
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## Overview of current work

- **Examination of aspects of distributed environments that concern federation**
  - multiple independent authorities
  - distribution of the development process
  - etc.
- **Areas currently worked on**
  - extensions to the client-server model
  - a generalized view of trading
- **An indication of future direction**
  - advanced service specification



# Authorities and the distributed development process





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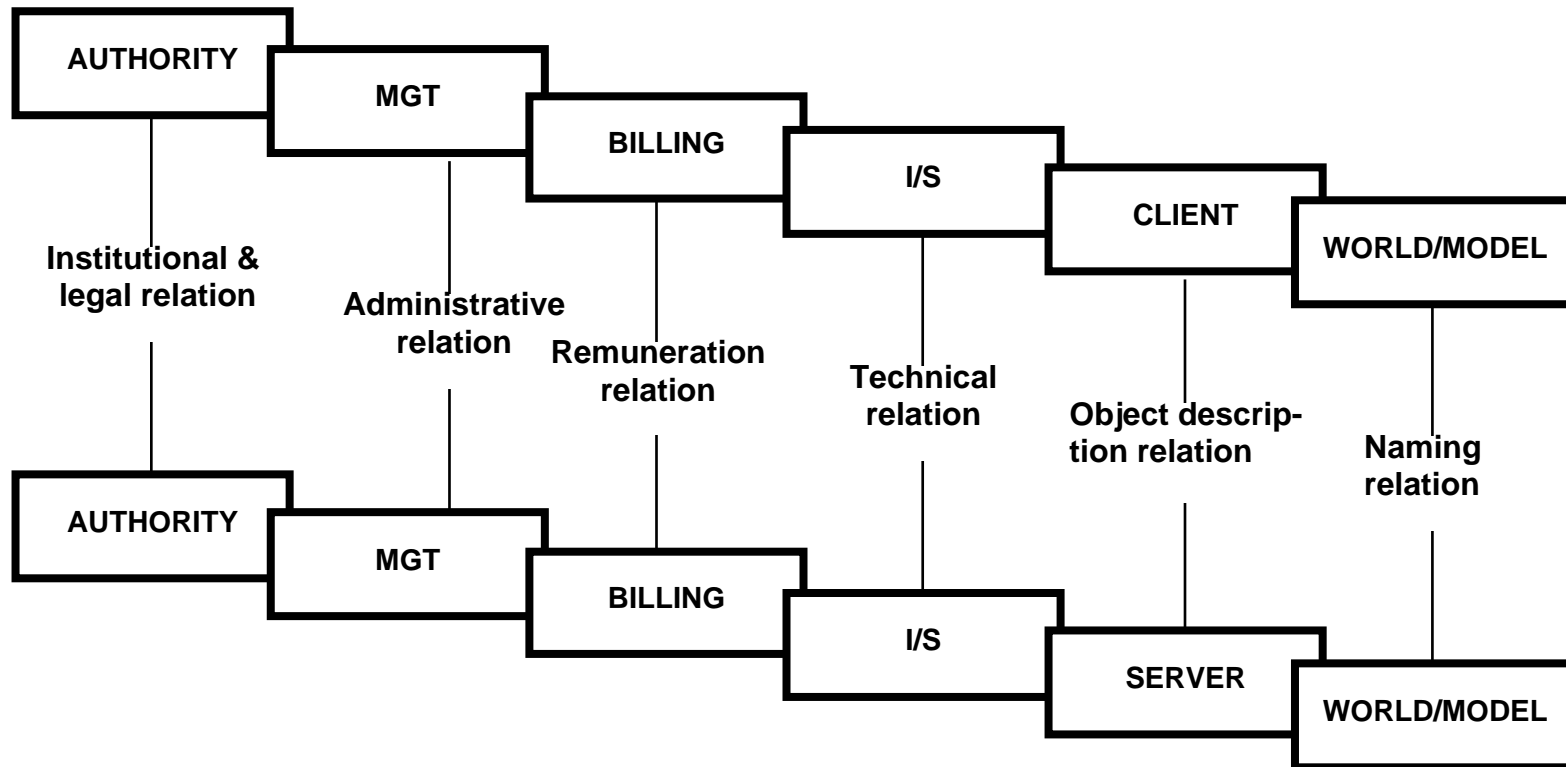
## Distributed environment issues

- **Authority**
  - the institutional framework
- **Management**
  - administrative and organisational frameworks
- **Accounting/Billing**
- **Application objects - object description**
  - semantics type
  - QoS
- **Infrastructure**
  - transparency mechanisms
  - comms protocol and addressing
- **Naming - defining real world objects**





# Relations between distributed environments





## **Establishing co-operation**

### **Responsibilities**

**function, structure and obligations are derived from a model of responsibilities**

- the responsibilities of the client, server and trading function are examined
- not only at run-time i.e. at all epochs
- **client**
  - provide a specification of the service client requires
  - provide a specification of what the client offers
  - provide a specification of client requirements on trading function
  - fulfil the client offer specification (e.g. pre-condition)



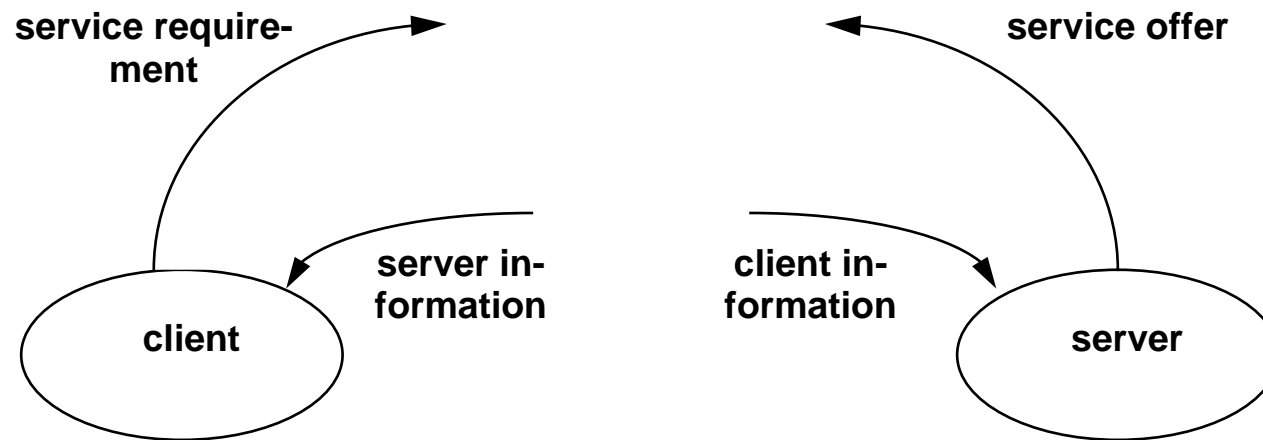
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## **Establishing co-operation responsibilities (cont.)**

- **server**
  - provide a specification of the service offered
  - provide a specification of the requirements the server has of client
  - provide a specification of the requirements server has for trading
  - fulfil the service as stated in specification (e.g. post-condition)
- **trading function**
  - provide a reliable/trustworthy/functionally accurate match-making service
  - provide the client with the necessary information on the server
  - provide the server with the necessary information on the client

## Responsibility model

- the examination of responsibility uncovers a symmetry between the offer and request





## **Processes** **— the functional model**

- **search for existing/creatable objects**
  - advertising from either client or server
- **select/match**
  - (specification conformance)
- **negotiation and agreement to co-operate**
  - legal and billing arrangements
- **bind the co-operating objects**
- **establishing communications**
- **use**
  - monitoring and billing



## Information — the data model

- **A description of the advertisement of an offer/request with four parameters**
- **1 offer set**
  - an indication of the set the offer/request is directed at
- **2 offer description**
  - $\text{offer}_s$  - a description of what is being offered by the service provider (QoS guarantees and post-guarantees)
  - $\text{request}_s$  - a description of what the service consumer expects the provider to provide and guarantee (QoS requirements and post-conditions)
- **3 request description**
  - $\text{request}_c$  - a description of what the provider expects the consumer to provide and guarantee (QoS requirements and pre-conditions)
  - $\text{offer}_c$  - a description of what is being offered by the service consumer (QoS guarantees and pre-guarantees)



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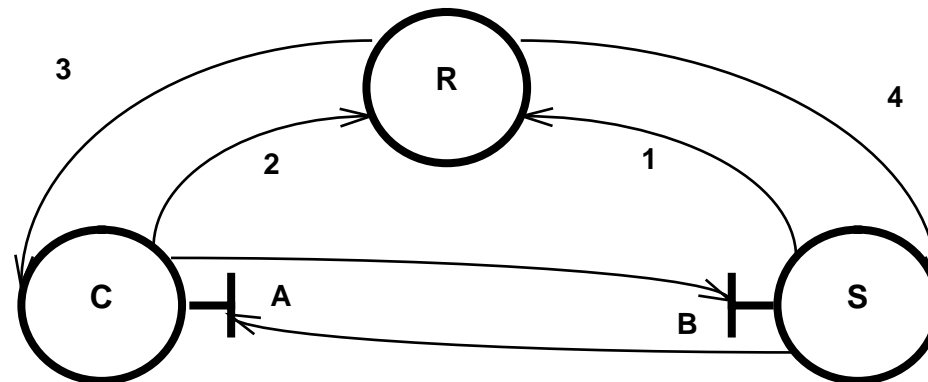
## Information

### — the data model (cont.)

- **4 policy**
  - a statement about how an offer is to be treated by the set owner/controller and subsequently by whoever obtains a reference to the advertised service
- **examples of types of policy**
  - visibility policy for service
  - search policy of service requester
  - creation policy
  - usage policy

## Activities

- Four stages



- 1. (R, offer<sub>S</sub>, request<sub>C</sub>, policy)
- 2. (R, request<sub>S</sub>, offer<sub>C</sub>, policy)
- 3. (lfref<sub>B</sub>, request<sub>C</sub>)
- 4. (lfref<sub>A</sub>, request<sub>S</sub>)





## **Generalised Trading model**

**The symmetric trading model includes access to management interfaces**

- **This allows the implementation of:**
  - **monitoring**
  - **accounting and billing**
- **Future work**
  - **including the symmetry requirements in the service specification**
  - **extending the model to include interception**