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ANSA Phase III

Slides for Eurocontrol

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Abstract

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Marketing and Contracts

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Technical perspective on ANSA

- *Open distributed processing systems*
 - *boundaries, authority and federation*
- *Architecture and system structure*
- *Standards*
- *Predictable system behaviour through Quality of Service management*



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 concerns***
 - Organizational, Accounting, Judicial, Economic
 - Contractual, Social, Political, Cultural
 - Technological (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***



Federation

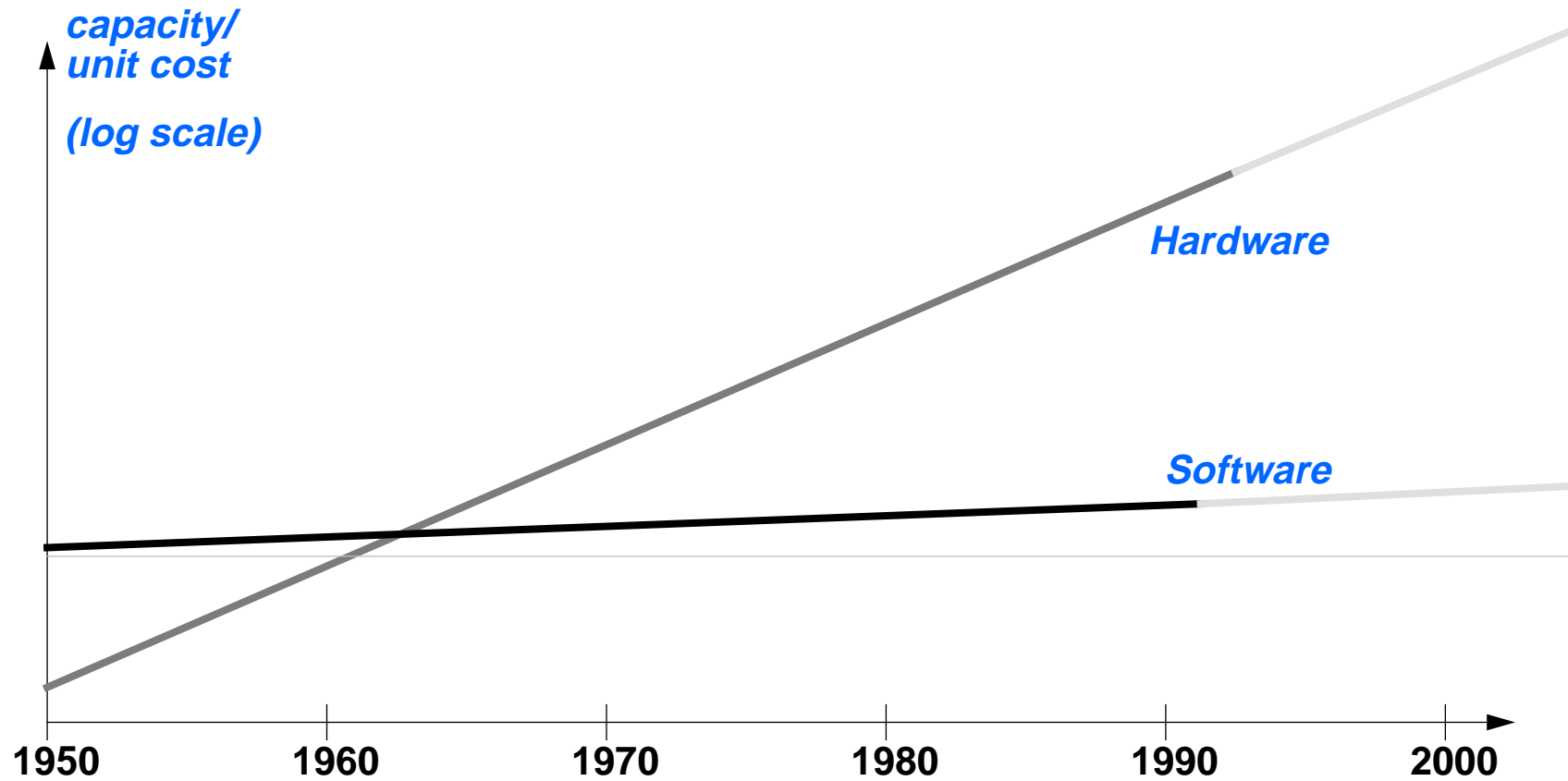
- *Real-world systems are federated, therefore information systems should also be federated*
- *Federation rules*
 - a member cannot be forced to do anything by another member
 - a member has freedom of association and disassociation
 - a member determines what it shares with other members
 - a member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



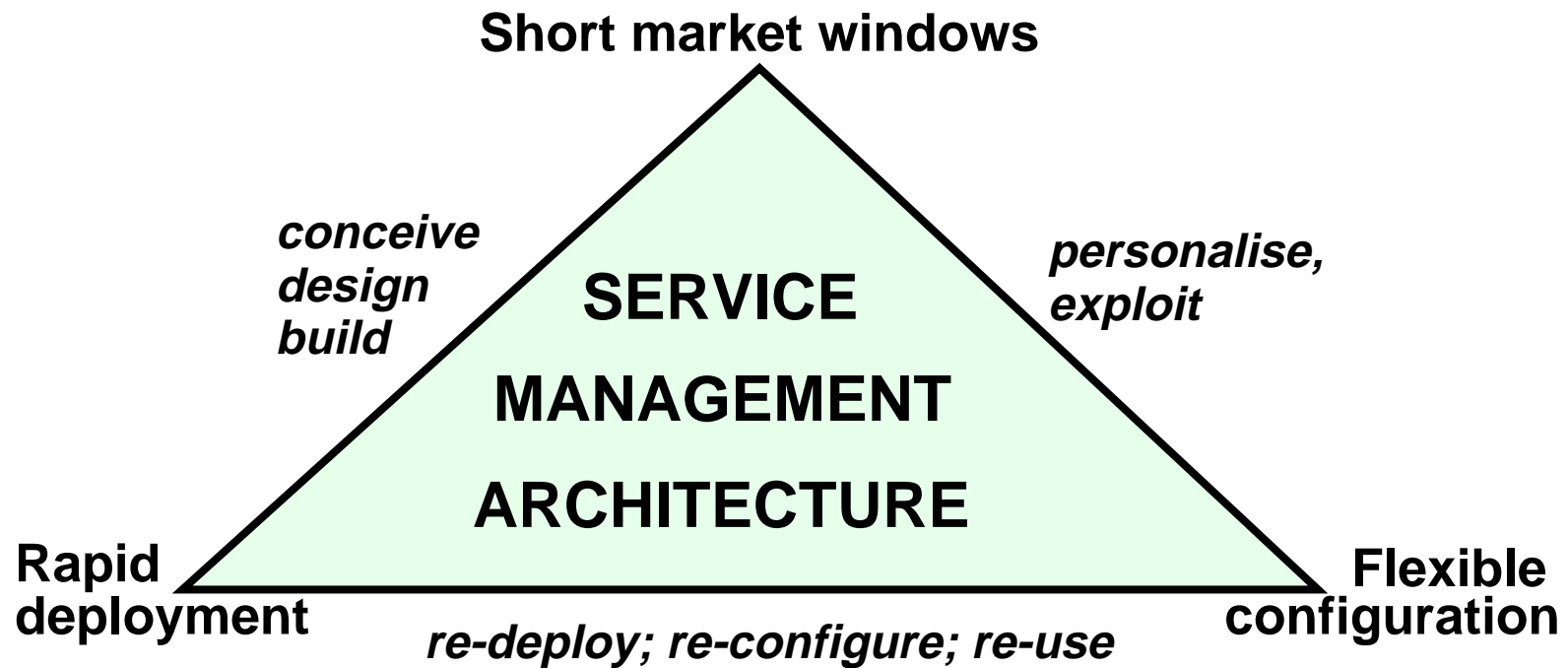
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Software cost



A service centred view



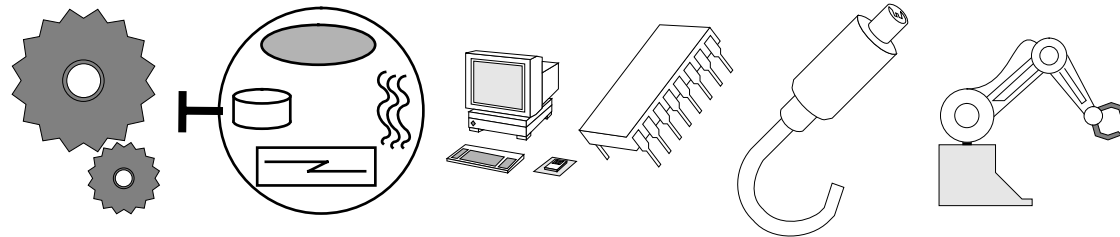


Main Themes

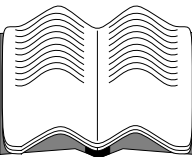
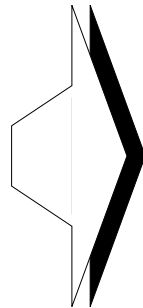
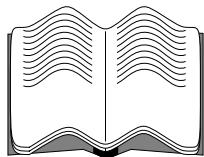
- *Separation and substitutability*
 - at **specification** time: requirement analysis techniques
 - at **design & implementation** time: structured design techniques
 - at **compile, link and load** time: object orientation
 - at **runtime**: object based (distributed) computing
- *Available and accessible object descriptions*

Architecture

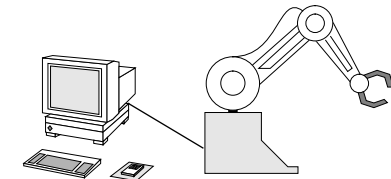
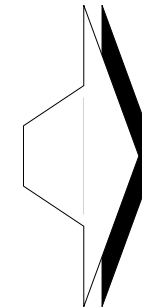
Basic building blocks



Combination rules



Recipes





Open Software Architecture

- ***Systems carry their own model so they can evolve***
 - specifications of components are visible from the system
 - implementations of components are available in the system
- ***Components are described as components in their own right (not by the process which created them)***
 - **purpose:** What is it for?
meaning: How may it be used?
structure: What other components does it need or consist of?
guarantees: What promises will be kept?
technology: What technologies are necessary?



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De Jure

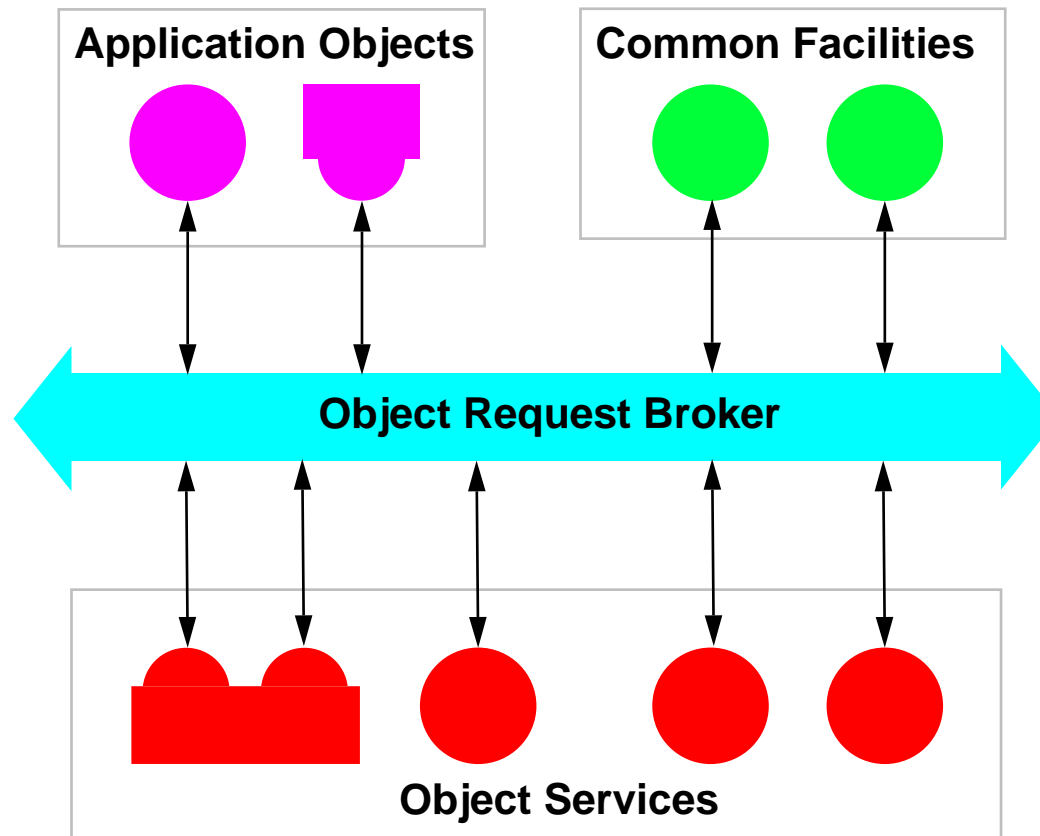
- ***International Standards Organisation (ISO)***
 - OSI (“7 layer”) standards on data communications
 - Specifies communication, not applications and machines that communicate
 - Standards therefore expressed in terms of what is observable on the wire
 - Various opinions on how this came to be
- ***ISO/IEC now working on ODP***
 - Concerned with how one builds distributed applications
 - Major ANSA contribution over the years
- ***CCITT aligned with ISO on computing standards***
 - Now called ITU-T



Industrial consortia

- *Vendor-driven (i.e. industrial alliances), e.g. OSF, OMG, TINA-C, UI*
- *OMG chooses specifications, so as rapidly to standardise OO interoperability*
 - No OMG involvement in writing software or specifications
 - Specifications populate OMG's Object Management Architecture (OMA)
- *OSF solicited technology contributions from members*
 - OSF central organisation stitched code together into distributions to vendors
 - Now changing towards ESPRIT-style model of funding external teams
- *Unix International came and went*
 - Worked on a distributed system architecture called Atlas

Object Management Architecture

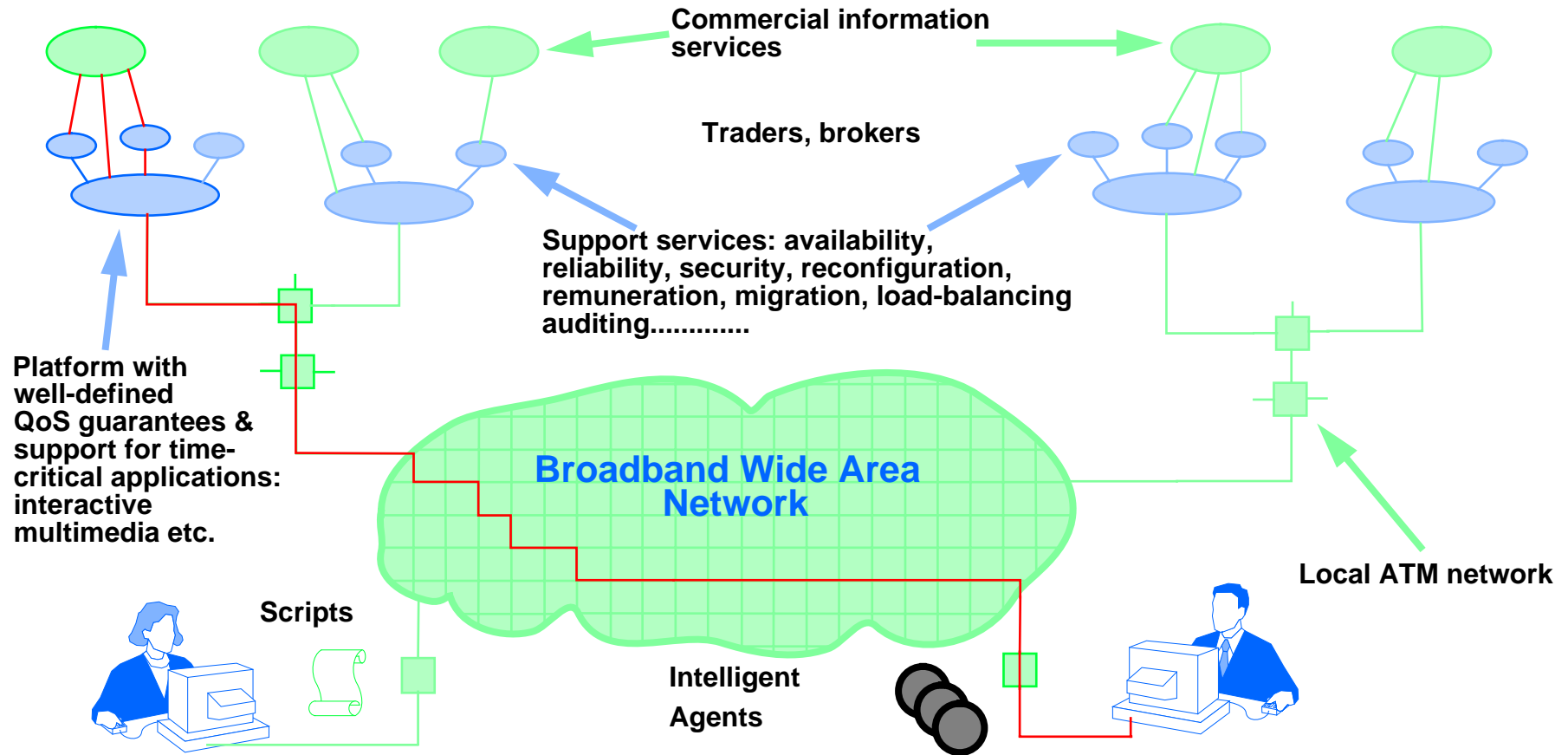




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Scenario





Predictable behaviour

- ***Distributed interactive multimedia***
 - object level cpu and time scheduling
 - stream support for voice and video
 - synchronous programming
- ***Distributed information systems***
 - intelligent agents and brokers
 - dependable services
- ***Declarative Programming Tools***



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