



Be open AND in control

(Open Distributed Processing)

Architecture Awareness Meeting

23 November 1995

Andrew Herbert
Rob van der Linden

Systems support the organisation

- **Must react to new business opportunities**
 - cannot be locked in to closed system suppliers
- **Technology advances rapidly**
 - faster than business structures change
- **Political, economic, social, and technological change**
 - organisational change (deregulation)
 - reduced computing and telecommunications costs
 - increased customer expectations
 - world wide interconnection

Risks

- **Diverse economic frameworks**
- **Different legal frameworks**
- **No common culture**
- **No common security framework**
- **No agreed quality standards**
- **No common technology**



Issue

- Your systems need to be flexible
- Freedom of choice for each member state

Options

- **No change**
 - fails to cope with growth
- **A single, agreed, pervasive system design**
 - fails to cope with inherentAn architectural framework

An architectural framework

- A set of underpinning principles to guide design choices
- Allow individual system design and autonomy
- Important to agree
 - common business goals
 - necessary and sufficient service interfaces

Benefits

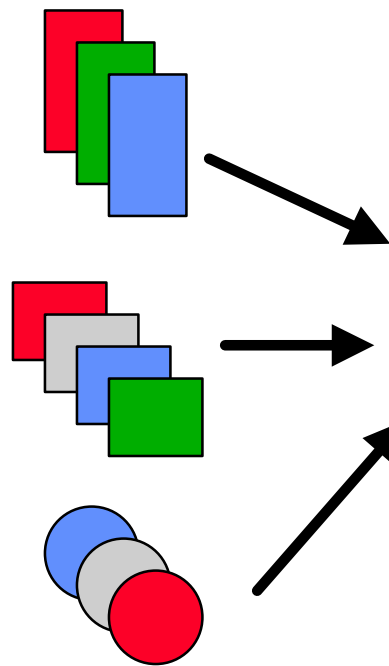
- **Resulting systems will**
 - be clearly defined and structured
 - less costly to construct and faster to deploy
 - configurable and durable
- **ATC organisations will**
 - obtain a wider choice of suppliers
 - be more responsive to market demand
 - each have greater individual freedom
- **Your customers**
 - will be better served

Needs

- **Interoperability between computer systems**
 - for exchange of services; not just data transfer
- **“Sympathetic” technical and business structures**
 - make the systems fit the business; not vice versa
- **Freedom to choose**
 - the product to fit the task, and the local circumstances
- **Standards that are necessary and sufficient**
 - to allow interchange, without curbing innovation

Architecture

components

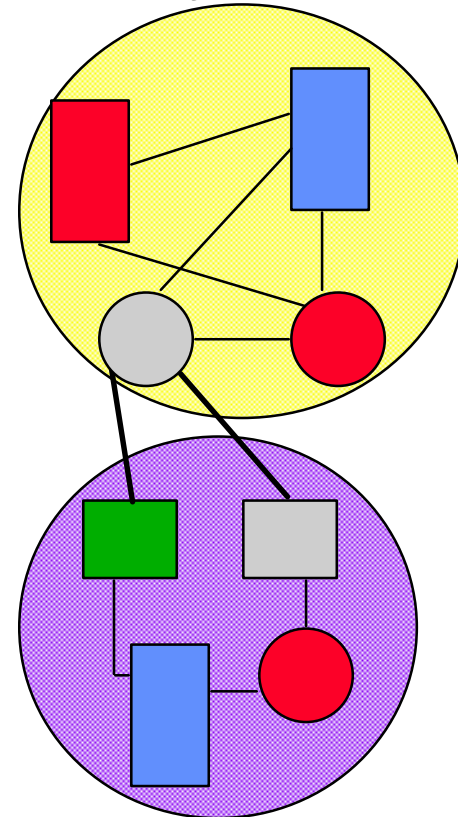


ARCHITECTURE

System development process

Specific system requirements

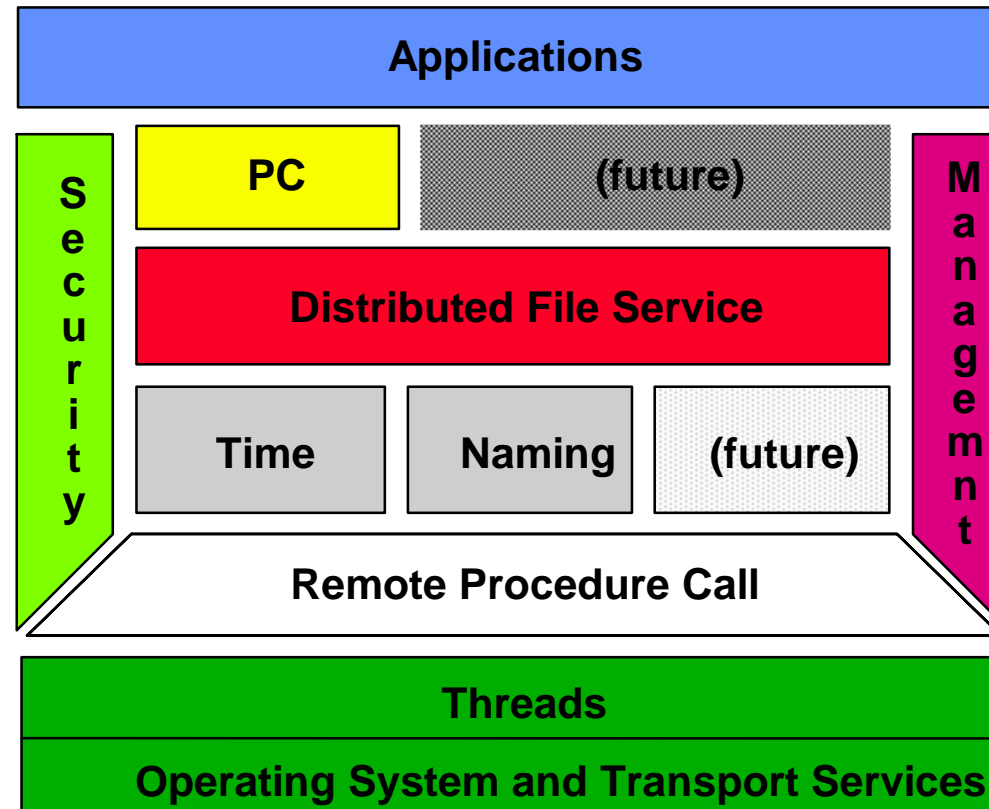
systems



Elements of an architecture

- **Concepts:**
 - clearly defined and delineated
- **Components:**
 - standard functional building blocks and tools for assembly
- **Principles:**
 - for capturing assumptions and deriving rules
- **Recipes:**
 - for satisfying commonly occurring Guidelines:
 - for taking design choices and trade-offs

“NOT an architecture”



An architecture for ATC, which

- allows different kinds of applications to interwork
- allows integration of products from many vendors
- preserves the investment in existing technology
- allows trade offs between
 - autonomy and uniformity
 - security and convenience
 - availability and consistency



... and which delivers systems that

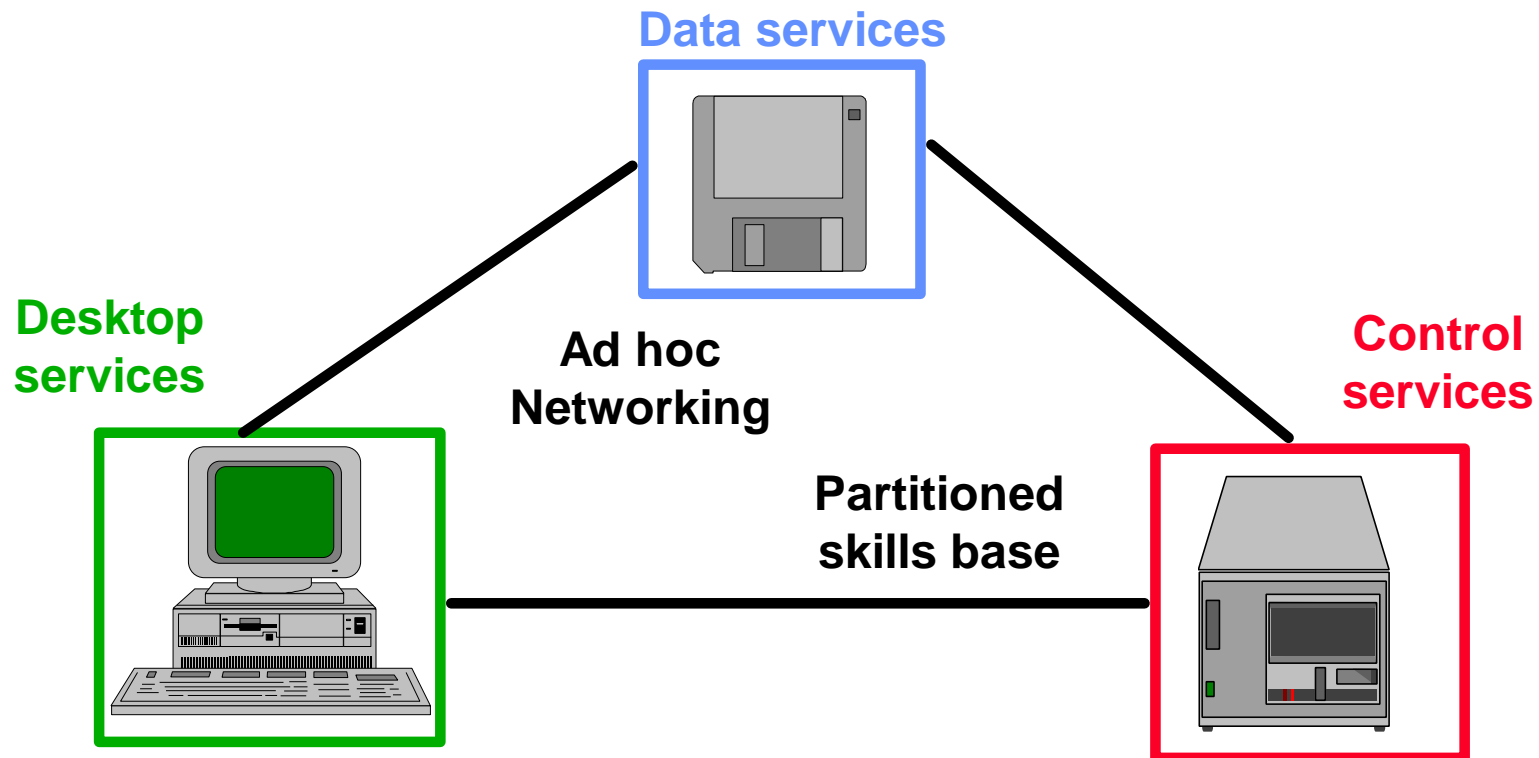
- can be owned and managed by many organisations
- have lower development and operating costs
- can grow (to a size larger than the phone network)
- can evolve gracefully
- allow applications to run on different platforms
- are interoperable, **dependable**, **real time**, secure

Architecture for open EATMS

Must be:

- easy to understand
- widely applicable
- durable and long term
- practical and proven
- vendor neutral
- backed by authority
 - international standards

Architecture aids coherence



Architecture for open EATMS

- Leaves YOU to decide:
 - which system design to adopt
 - which user interfaces to provide
 - which products to deploy
 - which development methods to use
 - when to upgrade

Architecture development

