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ANSA Phase III

Introduction to ANSA [ANSAworks '96]

Chris Mayers

Abstract

This presentation was prepared for ANSAworks '96. It is a technical introduction to ANSA, the architecture and the research programme.

It very briefly reviews the basic ideas of the ANSA architecture, then moves on to cover market trends, and the work done in ANSA Phase 3. It notes what has happened since ANSAworks '95 and comments on the predictions made then. I

(Individual ANSA Phase 3 projects are covered in separate ANSAworks '96 presentations. This presentation also does not talk about the future of IT and business since that is the ANSAworks '96 presentation immediately following this.)

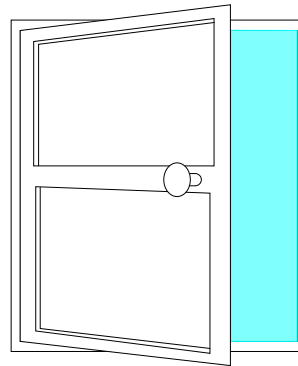
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An Introduction to ANSA



Chris Mayers (cmm@ansa.co.uk)



Agenda

- **A view of the IT marketplace**
- **The ANSA vision for exploiting current and future technologies**
- **New technical requirements that these pose**
- **How ANSA is tackling these new challenges**



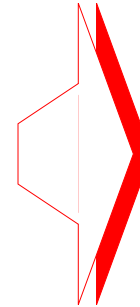
The Hidden Persuader in Open Systems

ANSA

Harvest research

Build on current technology
and open standards

Intercept new requirements



Vision

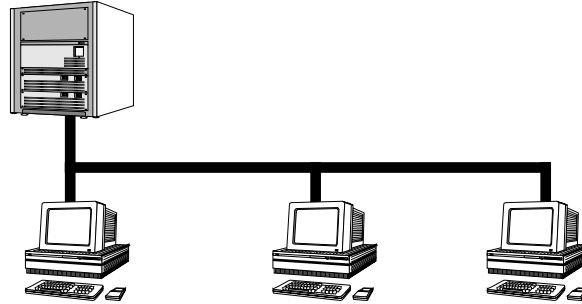
Architecture

Technology

Standards



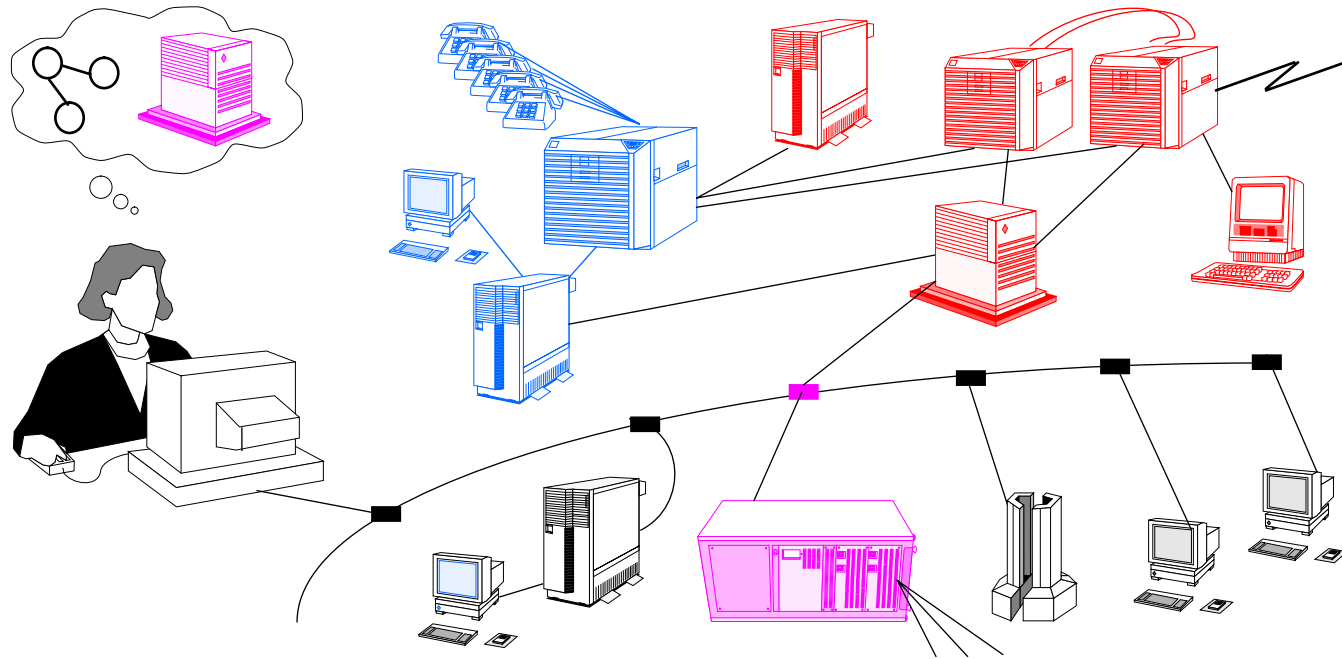
Issues for Client-Server Systems



- **Scalability**
 - can the system expand as needed?
 - can the system be deployed in small and large configurations?
- **Interoperability**
 - can the system interwork with other systems?
- **Dependability**
 - can the system be made reliable and secure?



Distributed Systems in the Real World



What's different about distributed systems

- **Diversity (heterogeneity)**
 - many types of hardware platforms, networks, operating systems, applications,...
- **Legacy**
 - many versions of software
- **Decentralization**
 - many points of control in many organizations

plus all the client-server issues on a large scale



Different policies for different applications

- *Availability versus Consistency*
- *Autonomy versus Uniformity*
- *Security versus Convenience*
- ... and many other unavoidable trade-offs



Technical challenges for distributed systems

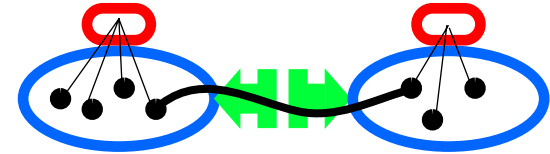
- **Distributed systems have different properties to centralized systems**
- **Different applications need different solutions**
- **Unnecessary complexity should be masked from the applications**



The ANSA Architecture

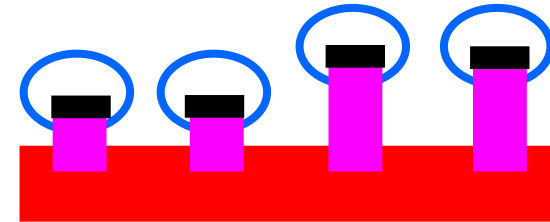
Trading and Federation

Controlled interoperability



Selective Transparency

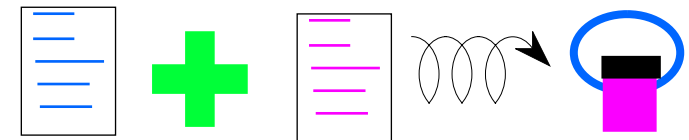
One size does not fit all



Abstract & Automate

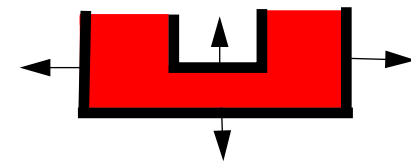
Tools replace APIs

Service Infrastructure

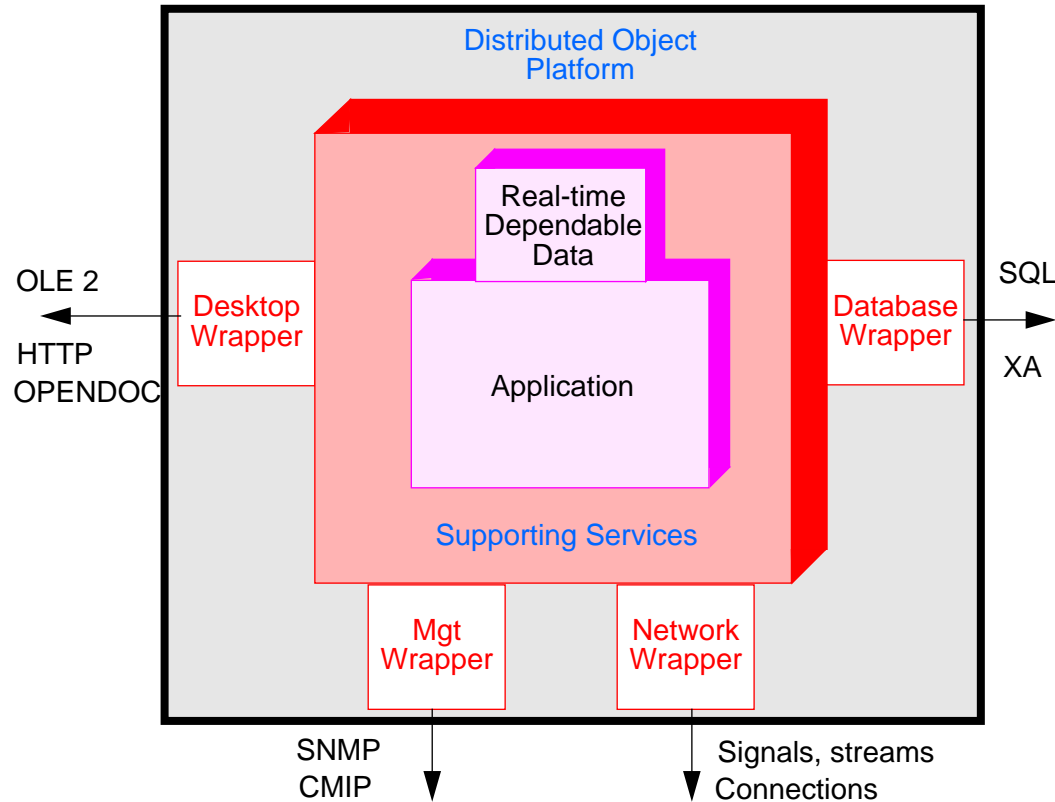


Modular Engineering

Plug and play infrastructure



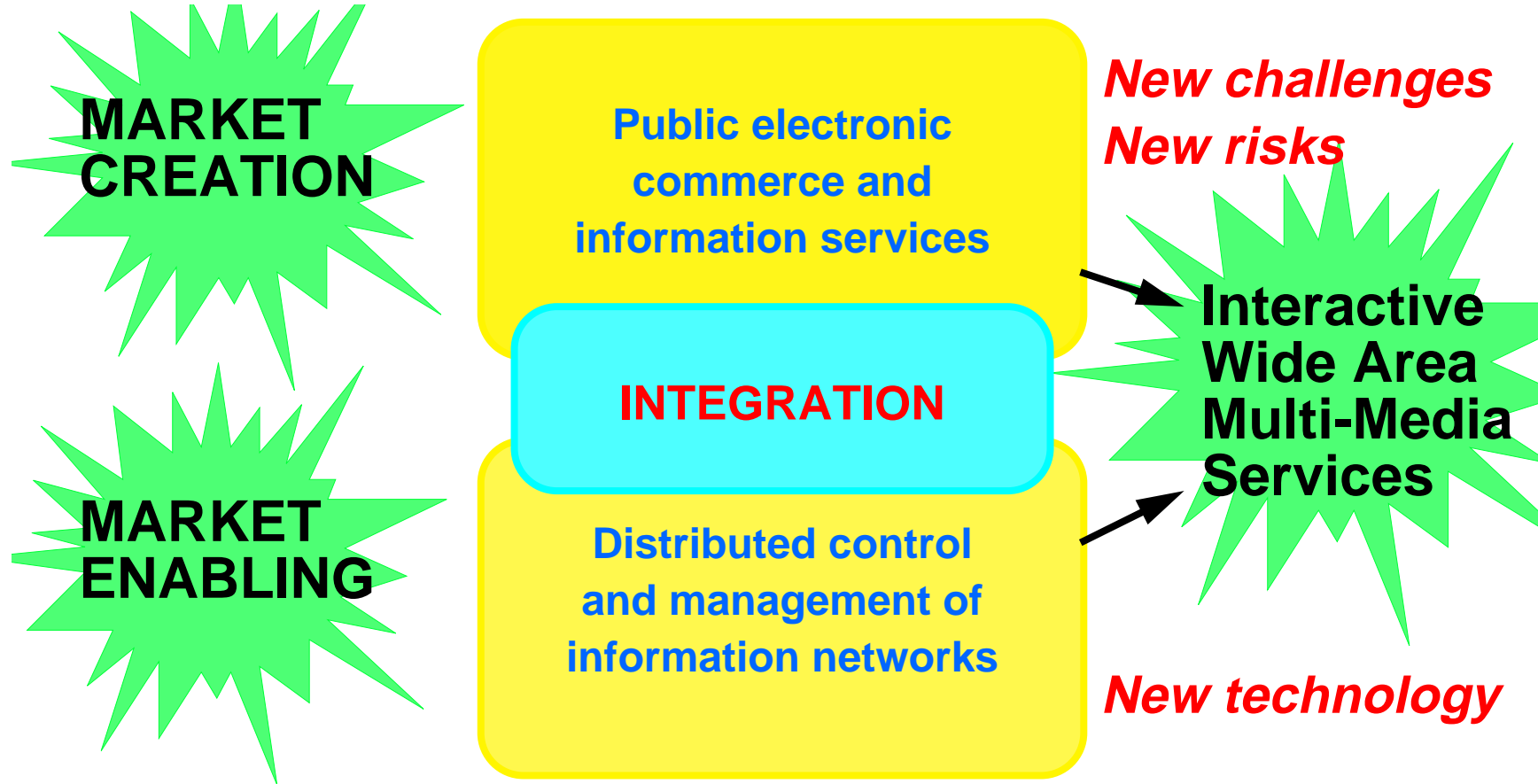
Distributed Object Environment for Open Systems



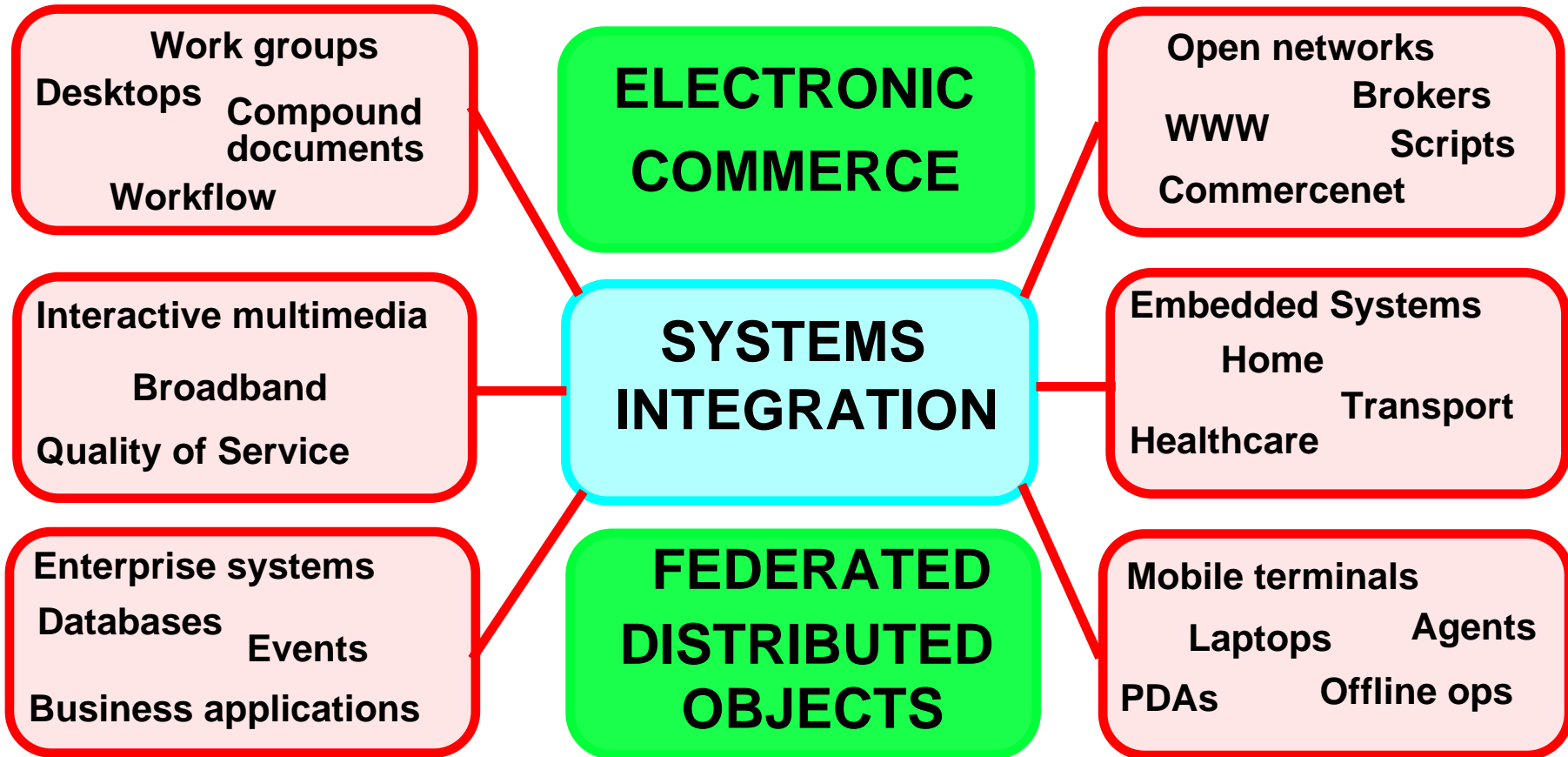
- Information service system
- Business process support system
- Systems management system
- Interactive multi-media system



The Market



ANSA Vision



New Requirements

Interactive Multi-media

Performance
Video/audio
CORBA++

Multiparty
QoS control

Open Networks

Federated naming
Intelligent broking and trading
WWW ++

Cooperative, autonomous management
Security

Distributed Information

Intelligent information filters and agents
CGI & JAVA++

Information servers
Computer assisted business processes

Embedded Systems

Down scaling
Predictable
CORBA--

Interoperability
Mobile

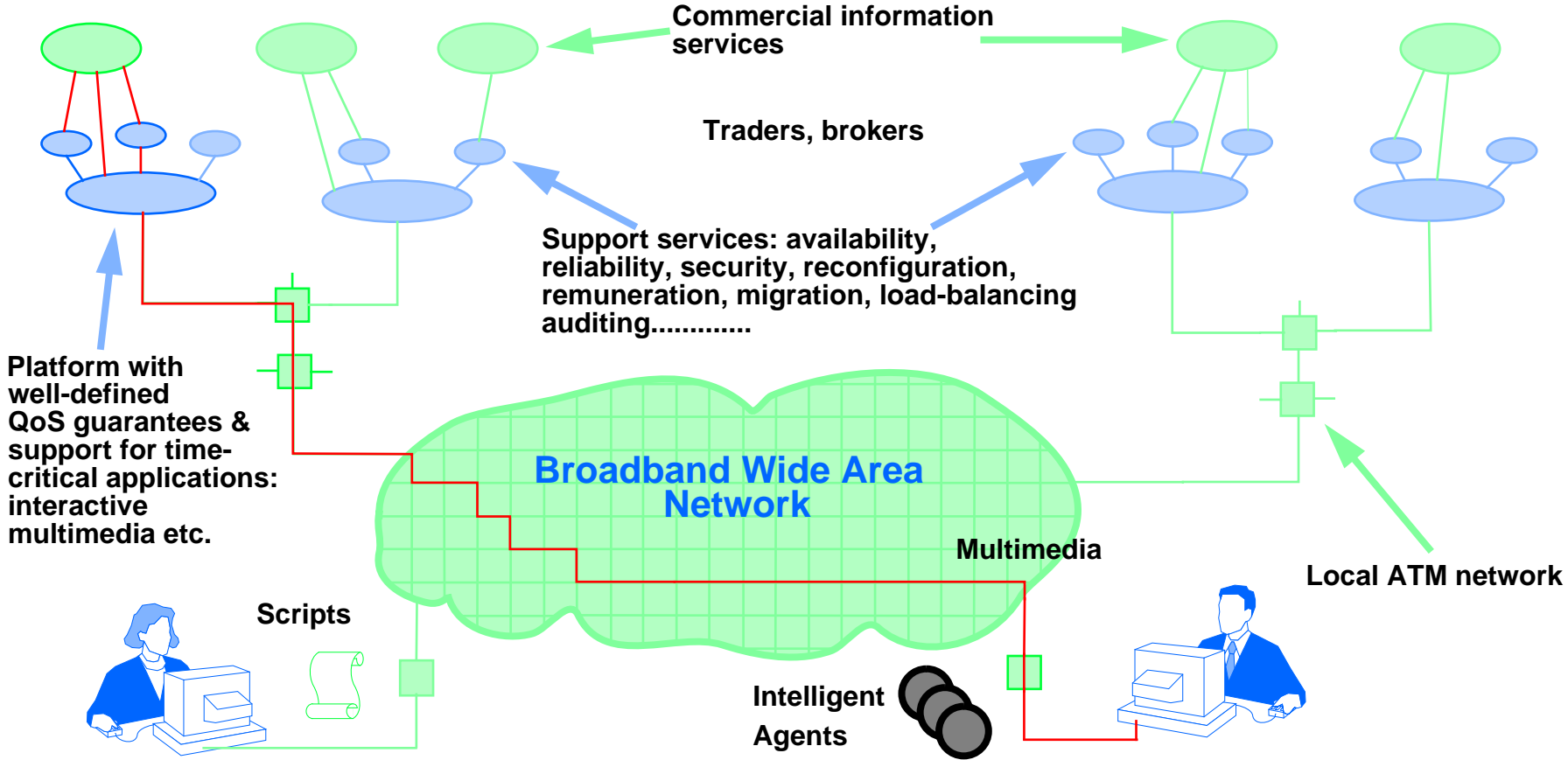


Meeting the requirements

- **Extend the ANSA architecture with new concepts and mechanisms**
- **Deliver prototypes**
 - to prove the concepts work
 - to show how to apply them
 - to enable application development
- **Propagate the knowledge into high-profile industry groups**
 - W3C, Smartcard Forum,...
- **Feed the expertise into standards bodies**
 - **OMG, ISO, ITU, OSF**



Scenario



ANSA Focus

**Public electronic
commerce and
information services**



**Explore,
demonstrate**



**Distributed control
and management of
information networks**



**Prototype,
extend,
validate**



Information Services Framework - the need

- **World Wide Web is creating a uniform information space**
 - **Good presentation and authoring tools**
 - **Poor navigation, administration and development tools**
 - **Inefficient protocols**
 - **No support for active documents**
- **Distributed objects can help**
 - **using a tool-based approach**
 - **applying experience with protocols**
 - **applying federation principles**

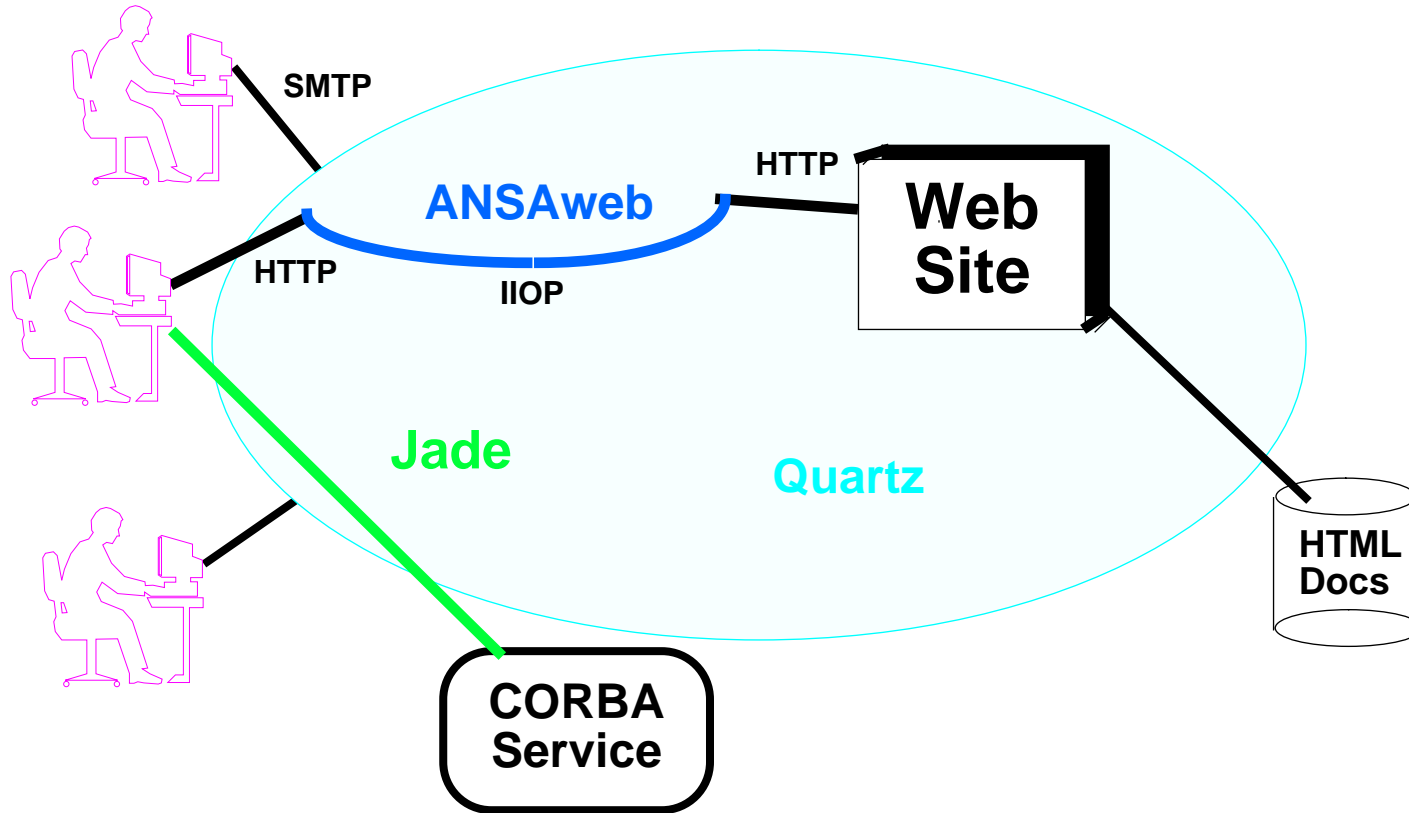


Information Services Framework - the key technologies

- **Internet, the World Wide Web and its protocols**
 - new capabilities still evolving and being standardized
- **CORBA, and its IIOP interoperability protocol**
 - for integrating distributed applications
- **Java**
 - for programming Internet applications



Information Services Framework



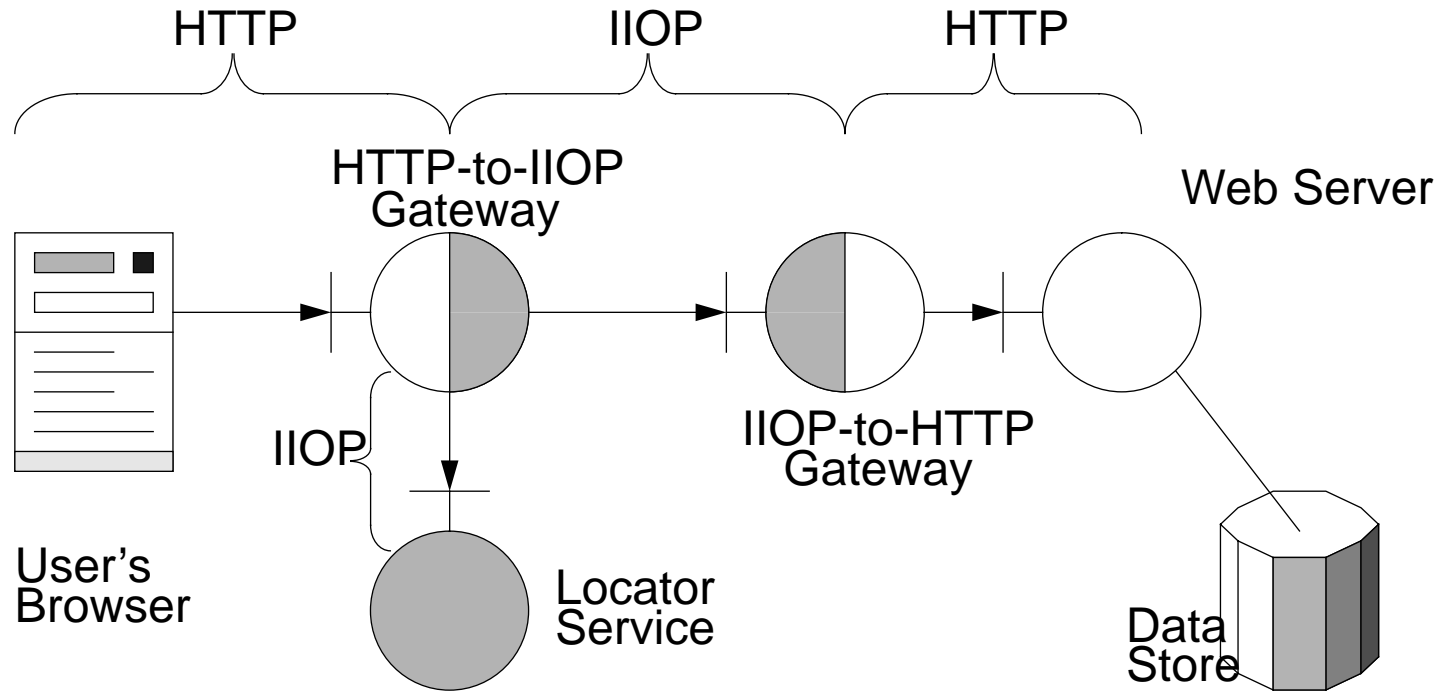
Information Services Framework - ANSA in action

- **ISF links distributed objects and the World Wide Web**
- **ISF focuses on security**
 - particularly in the associated E2S (End to End Security) EU project
- **ISF contributes to World Wide Web standards**
 - via IETF (Internet Engineering Task Force)
 - via participation in World Wide Web initiatives (W3C, and WWW conferences)



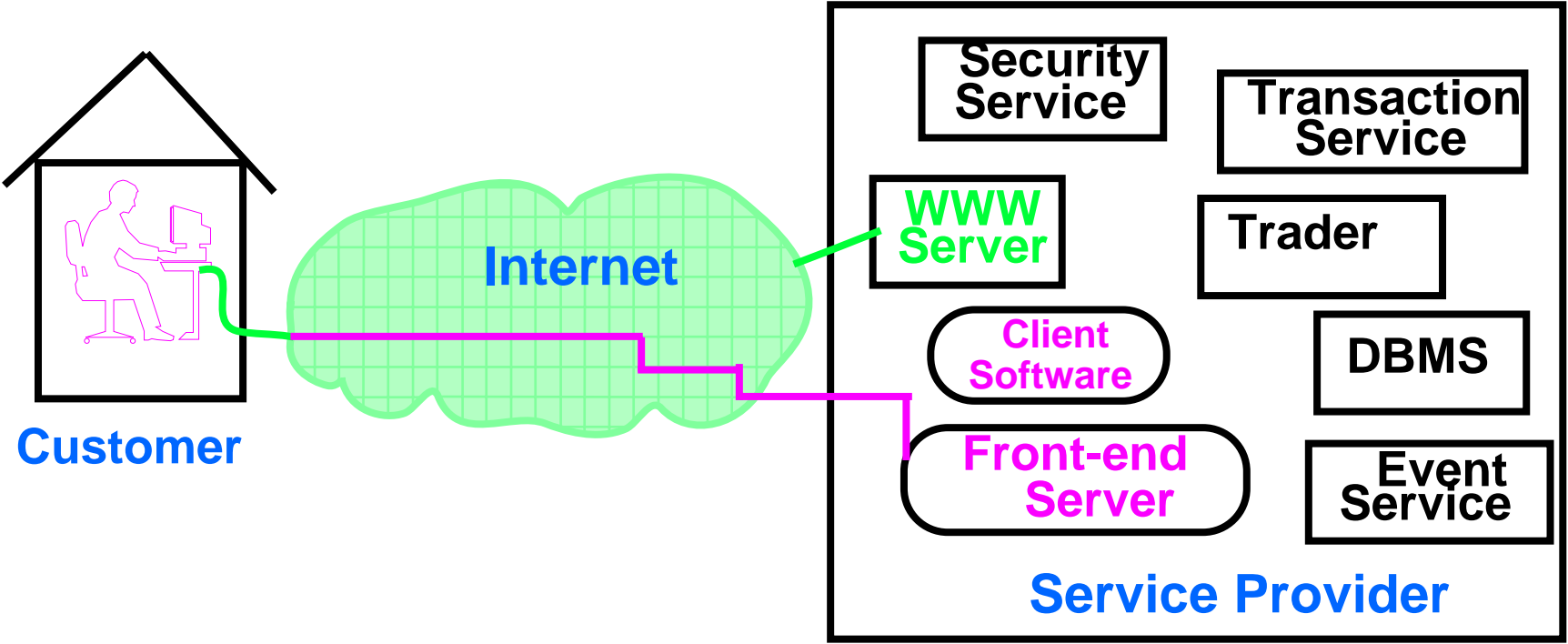
ANSAweb

Opening Gateways between CORBA and the Web



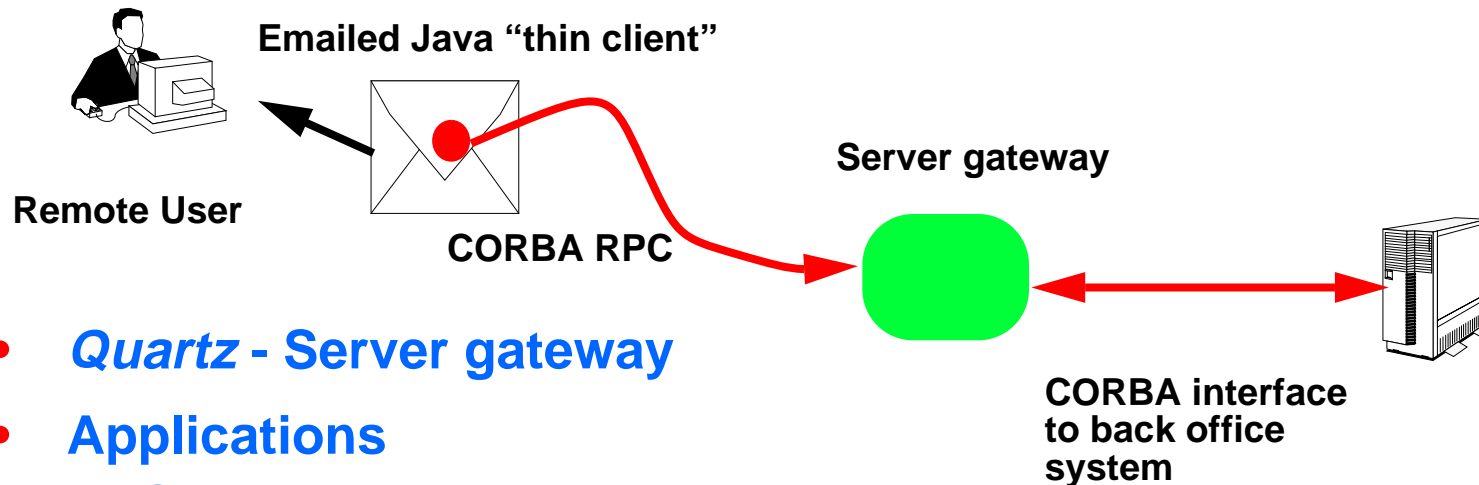
Jade

World Wide Web access to CORBA Services



Quartz

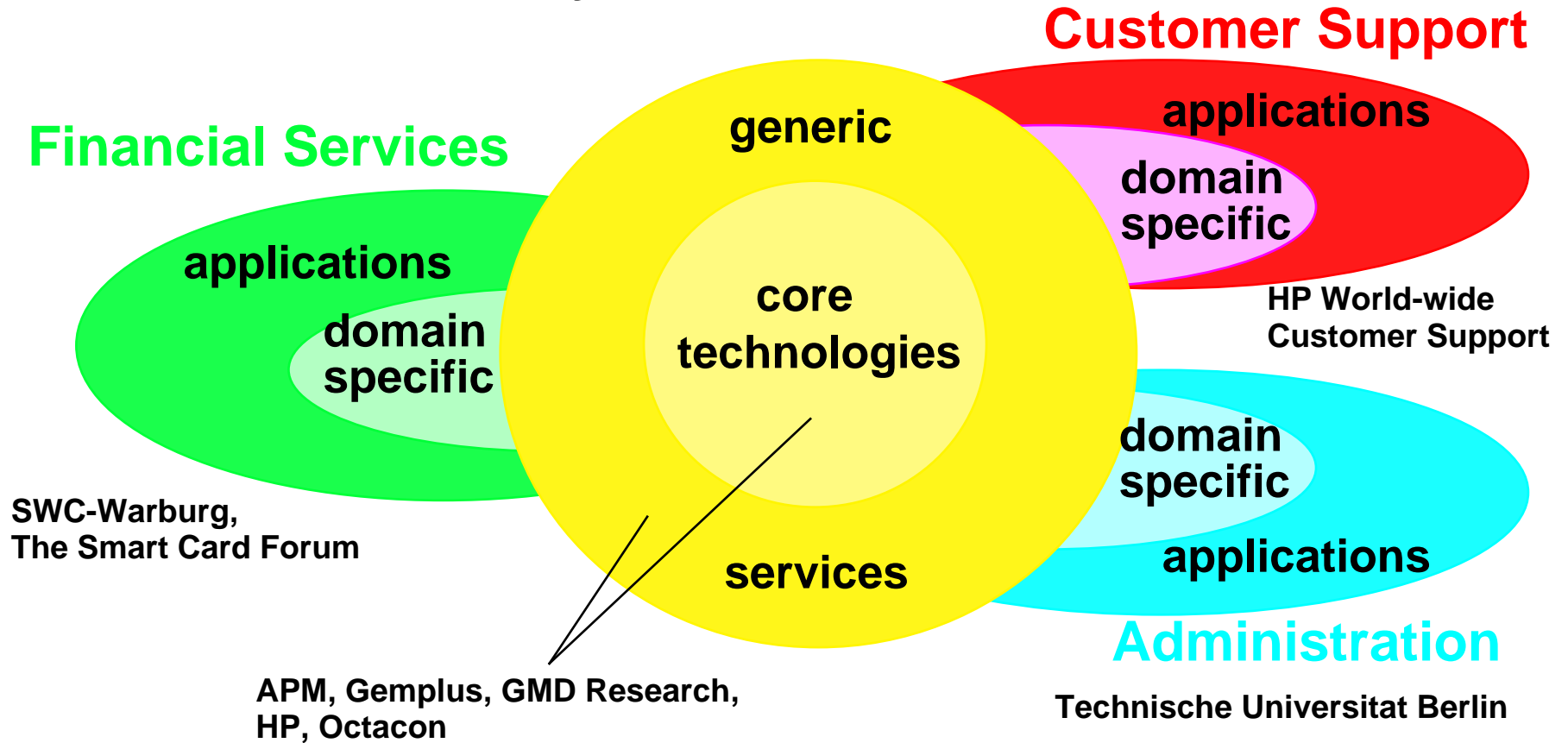
Making CORBA objects easier to reach



- **Quartz - Server gateway**
- **Applications**
 - Software distribution
 - Data collection - active forms
 - Custom client applications



E2S End-to-End Security for Internet Electronic Commerce



Distributed Multimedia Architecture - the need

- **Extend CORBA to handle multimedia streams, peer-to-peer communication, and quality-of-service negotiation and control**
- **Add real-time capabilities to the ANSA/ODP architecture**
 - **without compromise to federation, diversity, and scalability**
- **Provide interoperability between real-time and non-real-time objects**
 - **predictable islands in an unpredictable sea**
- **Provide real-time guarantees in an asynchronous distributed system**
 - **for high-performance distributed systems**
 - **for predictable distributed systems**

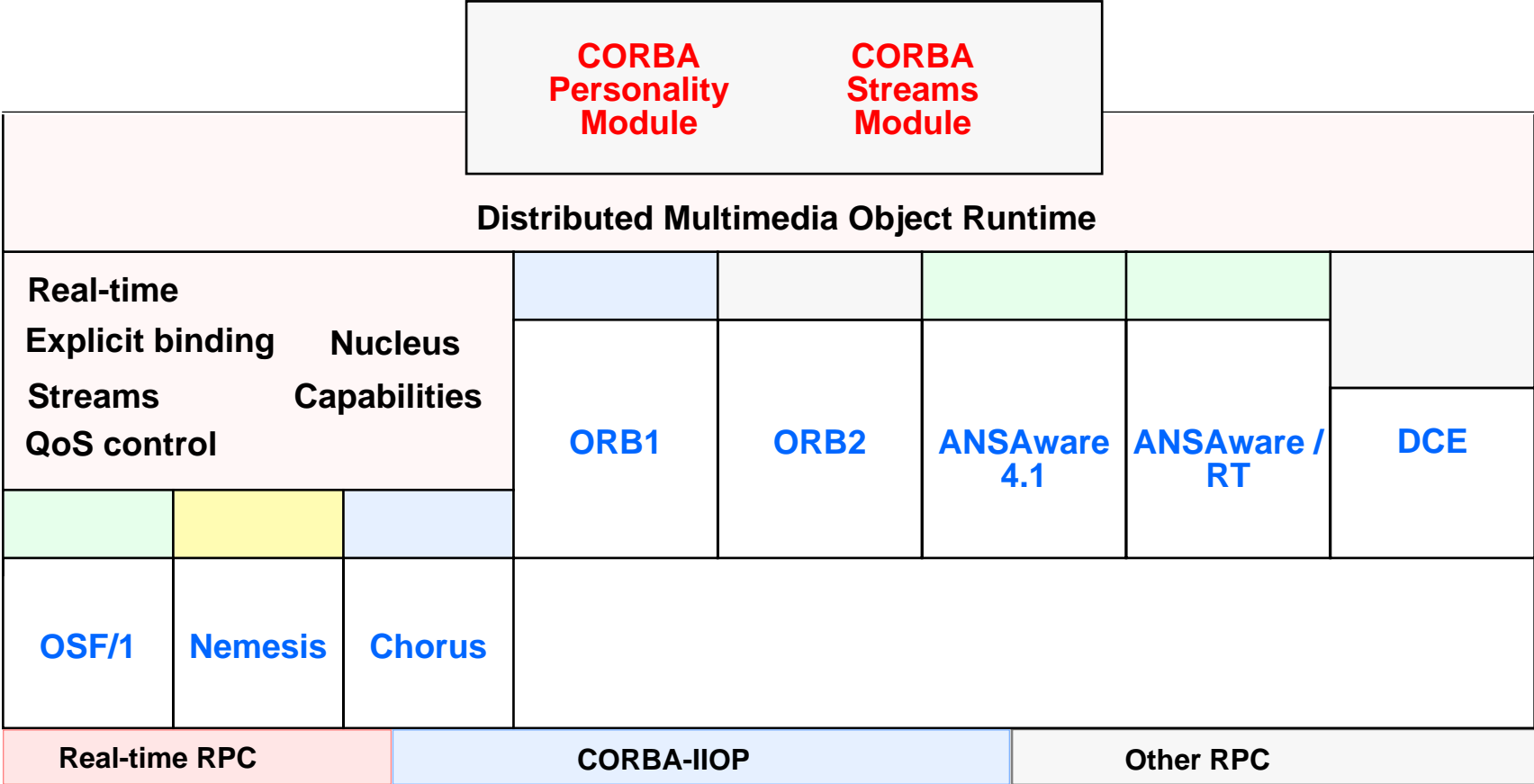


Distributed Multimedia Architecture - the key technologies

- **ATM (Asynchronous Transfer Mode) and broadband networking**
 - for multimedia streams with quality-of-service guarantees
- **Lightweight operating systems with multithreaded real-time support**
 - for high-performance, low-cost platforms
- **Distributed Processing Environments (CORBA and others)**
 - for distributed applications



Distributed Multimedia Architecture



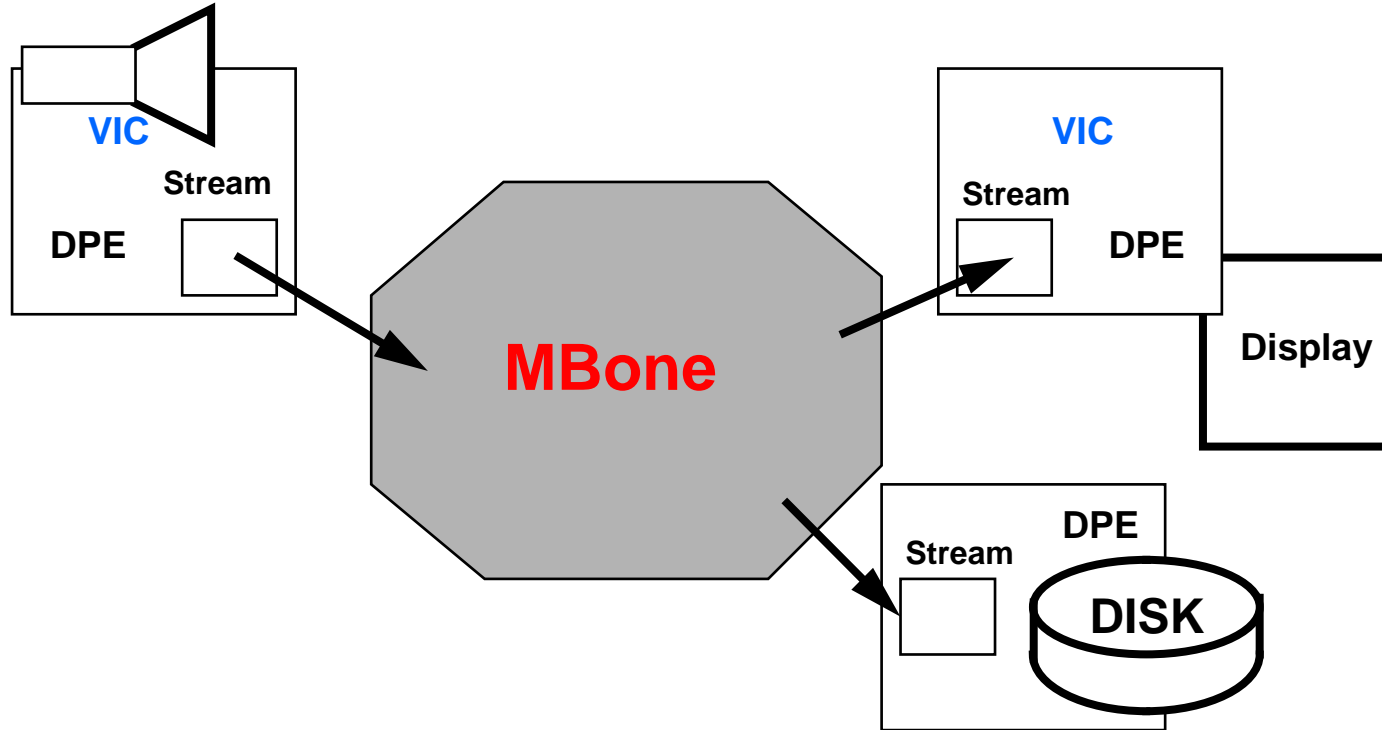
Distributed Multimedia Architecture - ANSA in action

- Real-time mechanisms are already proven in ANSAware/RT
- ANSA infrastructure adds CORBA compatibility
 - and prototypes CORBA extensions for multimedia
- ANSA multimedia demonstrations exploit CORBA extensions
 - Amber
- Associated projects add broadband capability
 - ReTINA
 - DCAN
- ANSA contributes to multimedia and real-time standards
 - via OMG Telecom SIG
 - via ReTINA into ISO/ITU-T Open Distributed Processing (ODP) and TINA-C



Amber

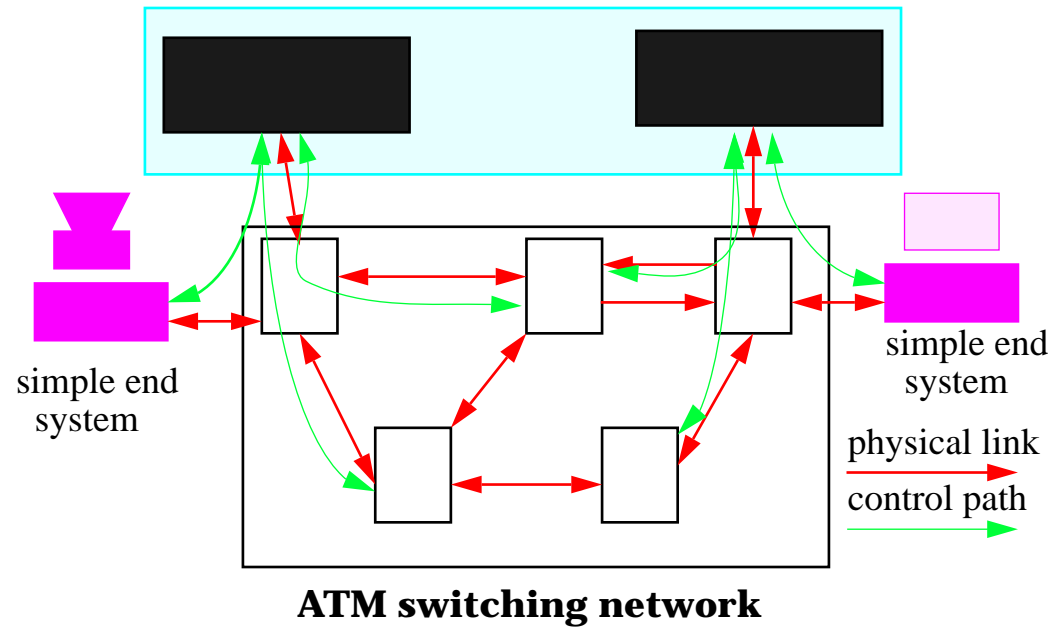
Delivering Real-Time Streams via the Internet



DCAN

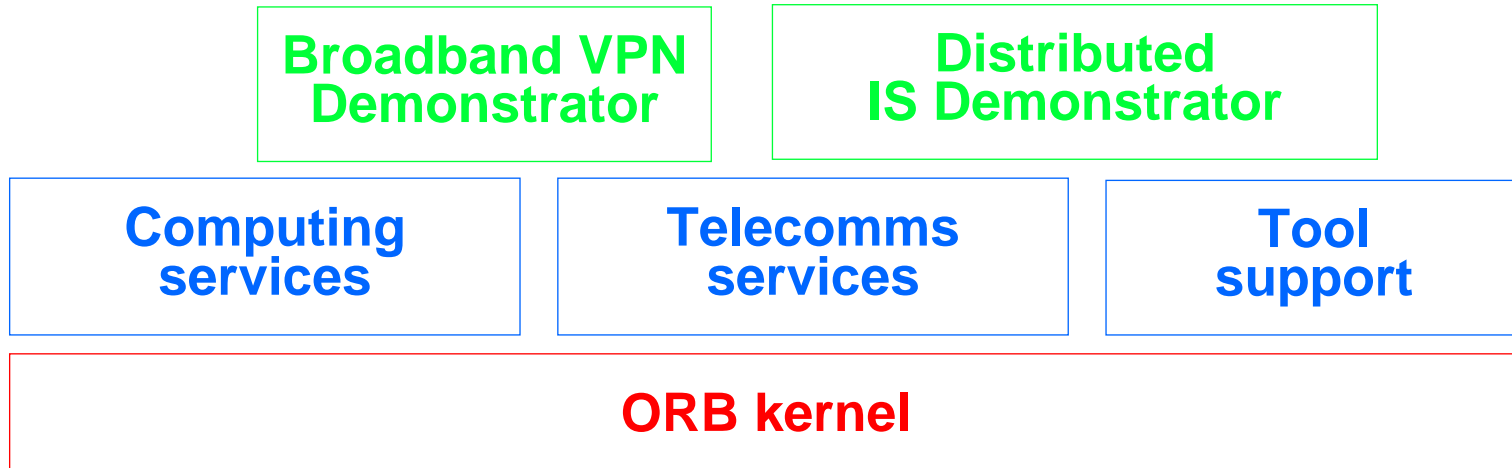
Distributed Control of ATM Networks

Control and management using a distributed processing platform

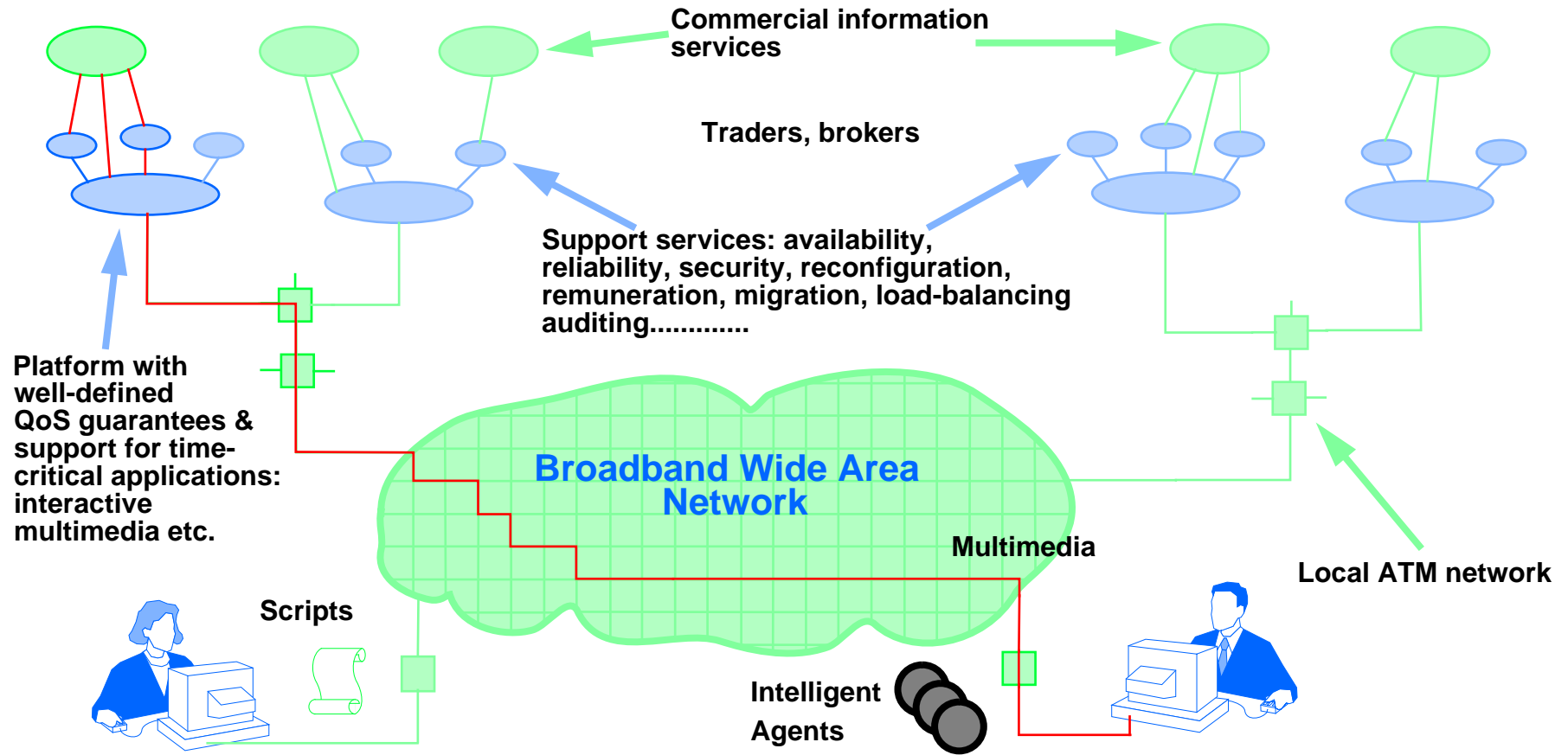


ReTINA

An Object Request Broker for Telecommunications



Scenario Revisited



Summary

- **ANSA is a firm foundation**
 - being extended through ISF and Distributed Multimedia Architecture projects
- **To find out more**
 - see <http://www.ansa.co.uk...>
 - ... and the rest of ANSAworks!

